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DRUGS AND MEDICINAL AGENTS CONSIDERED FROM THE PROFESSIONAL, ECONOMIC AND NATIONAL STANDPOINTS

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TO talk on drugs and remedial agents is an old theme carrying us back in the vistas of our imagination to the days of Dioscorides and Galen, and very justly awakening the query, what are the special conditions in the practice of our profession to-day which have induced your esteemed President to consider a paper with the title which has just been announced as opportune, and perhaps interesting, at the present moment?

After some consideration I have deemed that the first and perhaps most outstanding fact in regard to drugs as a whole is the position which they at present hold in modern therapeutics. Years ago they were deemed to be of the first importance; without them there was no therapy. To-day, with the exception of the few which have a definite specific action on some of the discovered causes of disease, drugs in general have been relegated to a distinctly secondary place, For the cure of disease the physician to-day places more confidence in fresh air; on rest, either systemic or local; on a carefully arranged dietary which will afford a sufficient number of calories with the proper proportion of proteids, carbohydrates and fats to supply most perfectly the wants of the organism without unduly taxing any weakened or suffering organ; and on a rational application of the principles of hydrotherapy.

Certainly with the exception of the few diseases for which we have specific treatment, I know of none in which, if I had to make a choice between the use of these remedial measures and the use of drugs, I would not invariably choose the use of the former.

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This preëminence of these remedial agents in our modern ideas of therapy, the profession owes in great measure to the almost world-wide study of the conditions which influence the course of an infection by the tubercle bacilli in man and animals. No one advance in modern therapy has conferred so much benefit upon the sick and ailing as the recognition by the profession of the health-restoring properties of free, fresh, flowing air. I was much interested the other day when listening to an address by Dr. Frank Billings, of Chicago, on vaccine therapy, to hear him state that comparing the records of many hundreds of patients treated by the most carefully prepared autogenous vaccines, with the records of patients who received no vaccines but were placed under the most favourable hygienic conditions, with rest, abundance of fresh air and a carefully regulated dietary, he found that these latter with no specific vaccines had their defences aroused quite as quickly and as fully as those who received vaccines. On the other hand, in a few who received the vaccine treatment, but in whom no attention was paid to conditions of general hygiene and careful upbuilding of the strength, it was noted that the vaccines of themselves did not bring forth much of a response.

The importance of a dietary arranged to suit the digestive capabilities of the sick was recognized by Hippocrates, but it is only in recent years that physicians have appreciated the value of an estimation of the actual number of calories daily consumed by the patient in his food as compared with his actual requirements, and have recognized the benefits to be derived from such a modification of the amount of proteid, carbohydrate and fat as to supply efficiently these requirements without overtaxing any damaged or unduly fatigued organ. Still more recently they have been shown how much can be effected by a high caloric feeding on the one hand and by a brief starvation period on the other. Unquestionably this triad of fresh air, rest, and careful dietary should occupy the first place in our system of therapeutics at the present.

In the limited time at my disposal it is impossible to make more than a brief reference to vaccine and serum therapy, which now threatens to lessen yet further the need for drugs and thus to relegate them to a position of still minor importance in therapeutics. Two decades ago the profession hailed the introduction of this new method of treatment with the greatest optimism. It was hoped that by its means we should be able so to strengthen and hasten the development of the body's natural defences that we could promptly antagonize the causes of disease and combat infection with its own weapons. These natural defences, however, have proved much

more complex and multiple than at first even the scientists reckoned upon, and progress has been difficult and slow. Unfortunately, while scientific medicine has been earnestly and perseveringly working at these most intricate problems, many commercial houses by the introduction of practices not in harmony either with the conditions demanded by the primary hypotheses or with the teachings of bacteriology, and also by the publication of extravagant statements founded on no scientific evidence, have misled many in the profession into the use of mixed vaccines and semi-secret unstandardizable mixtures of bacterial products.

While it may perhaps be said that clinical investigation indicates that some temporary benefit may follow the injection of many protein substances in chronic infections, the general results obtained under observation have been most unsatisfactory. "Fundamental principles demand that therapeutic vaccines be composed of bacteria as little different and as little removed as possible from the special strains of bacteria causing the infection against which the vaccine is to be used." (Hektoen.) Therefore autogenous vaccines alone are to be relied upon, and it would appear a simple matter in almost every case for such to be prepared at the same time that the bacteriological diagnosis is made. We may add that the physician who accepts the mixed vaccines of commerce without knowing the exact etiological factor of the infection treated, certainly abandons rational medicine and gropes in the dark.

Concerning the use of drugs in our therapy a second statement that can be made, and which appears to me of great importance, is that the profession as a whole, while using drugs freely, often too freely, gives too little study to our gradually increasing knowledge of the exact physiological action of drugs and too little study to the dosage in which they should be employed. Drugs are to-day often prescribed with an erroneous idea of their power to influence special conditions or symptoms, and are often used in unsuitable doses. As simple illustrations the following may be cited: It is now generally agreed that a digitalis action when demanded by the heart's condition is best obtained by the use of the drug in full doses till its effects become manifest. In many prescriptions that I have seen the amount given is too small to secure the greatest benefit. To obtain results from the use of strychnine as a respiratory stimulant larger doses than the 1/50th or 1/60th grain in which it is often prescribed, are necessary. The strength of tincture of nux vomica in the last edition of the *Pharmacopœia* was reduced 50 per cent. to make it correspond with the strength of this tincture in other countries.

I have asked several druggists whether physicians had made any difference in the amount of this tincture ordered in their prescriptions before and after the change went into effect and have been told that very few had done so. Physicians cannot expect that ten minims of the new tincture will have the same result as ten minims of the old. On the other hand the preparations of iron are generally prescribed in unnecessarily large doses and purgatives are ordered with a too lavish hand. As a consequence of this indifference, or ignorance, the physician fails to get results, and his confidence in the official drugs, and perhaps his confidence in himself as a prescriber, is impaired.

Associated with this imperfect knowledge of the exact action of drugs, and the indifference to the proper or necessary dosage in which they should be prescribed, an increasing tendency has been evinced by teachers in hospitals, by writers in many text-books, and often by consultants, to undervalue the use of our official drugs in the treatment and relief of symptoms. Very properly etiology, diagnosis and prognosis in disease are all important, but ailing patients demand some mitigation of their troubles and by means of our official drugs, properly employed in proper doses, we are able to give all possible relief. Psycho-therapy, the influence of one mind on another, moreover, is a welcome addition, and may undoubtedly be of much service; perhaps be all that is required, but its use demands tact and judgement.

Another fact which for many years has appeared to me as unfortunate, is that the list of drugs in our *Pharmacopœia* is such a long one. Even the last edition contains for each of us a large number which long ago we consigned to the dust-heap; such as most of our antispasmodics and of our astringents, many of our drastic purgatives, many of the so-called bitter tonics and stomachics; also the phosphates and hypophosphites so often vaunted to the general public as nerve food, and many other drugs of a problematical value which have been allowed to slide through our brain cells into the region of forgetfulness; and very properly so.

Shortly after I received the appointment of professor of therapeutics in McGill University, Sir William Osler—then to us simply "Osler"—on a visit to Montreal, came and congratulated me on my appointment. "Don't teach the students many drugs, eight or ten are all that is necessary, but teach them these thoroughly," he said. I did not agree with his limited number then, but year by year I am becoming more and more of his opinion. My list of valuable drugs lessens, and although I am not yet limited to ten, I yearly decrease the number of those taught to my students

and emphasize to them the greater importance of knowing a few drugs thoroughly, rather than of knowing many drugs imperfectly.

Partly as a result of this relegation of drugs to a secondary place in the treatment of disease; partly as the result of a lessened confidence in the beneficial action to be obtained from the employment of our old official drugs; and partly also from a desire to exploit new drugs and new preparations, the physician to-day, I fear, is gradually using the drugs and preparations of the *Pharmacopœia* less and less, and in their place is prescribing the ready-to-hand formulæ of the manufacturing chemists, and not infrequently their proprietary preparations under patented names.

Large manufacturing houses of limited liability and immense capital, employing a skilled and highly educated staff, have been certainly in many ways of much service to our profession. Their triturate tablets, hypodermic tablets, and compressed tablets; their sugar-coated and chocolate-coated pills; their delicately-flavoured and brightly-coloured elixirs, and their sterile ampoules, have been of great assistance in our prescribing, and will be so long as the manufacturers are obliged to maintain a high standard of strength and purity. This, however, will require government supervision. Undoubtedly such preparations as I have mentioned tend to favour economy for the patient, and add greatly to the convenience of such physicians as are obliged to dispense their own prescriptions. Much caution, however, must be exercised, and an absolute veto be placed on the use of proprietary combinations with patented names, or on any preparations of which the formula is hidden or obscure.

The profession should speak on this matter in no uncertain tone, for to-day many of these manufacturing houses and many brazen-faced pharmacists have gone much further than to offer us our official drugs put up in form convenient for administration, or blended in special formulæ of their own devising, stated to be suitable for all constitutions and conditions. Many of them now attempt to give advice to physicians as to the latest treatment of disease and foist prescriptions upon us containing some so-called new chemical agent—otherwise a well-known drug under a new proprietary name. Still worse, in our own medical journals, which we are supposed to control, proprietary nostrums are ethically(!) so they state, offered only to the profession with highly exaggerated and totally unproven statements, claiming for their special combination all kinds of miraculous powers. Their agents, fresh from schools of plausible advertising, flood our shelves with their free samples and our desks with their blotters emblazoned with the sug-

gestive names of their special nostrums. Their literature arrives with every mail and is full of unwarranted statements loudly vaunting the virtues of their specifics; on every page flaunting ready-made prescriptions for the physician to copy, in which a valuable official drug is shown in combination with their wonderful elixir vitæ, thus salving the conscience of the physician, while the nostrum manufacturer exacts his heavy toll in the price paid.

May I ask this gathering whether they think a physician treats honestly a patient who consults him, when he prescribes a bottle of So-and-So's Compound Terpin Cough Mixture, or another So-and-So's Digestive Elixir, or a third quack's Wonderful Life Restoring Iron Tonic, when he knows little of what drugs are contained in them and nothing of the amount of the often powerful drugs he is actually giving when he prescribes such nostrums, and trusts implicitly in the statements of "Truthful James" the nostrum dealer? Can you afford me a better illustration of the blind physician leading the blind patient? You know the result.

All this nostrum and proprietary business depends upon secrecy, upon the zeal and assurance of the advertising proprietors, and upon the gullibility of the purchaser. Patent medicines, unless they contain some dope, are short-lived.

A very instructive story is that of Dr. Warburg, of Vienna. About the middle of last century Warburg's solution of quinine was very highly esteemed in many countries. The Austrian Imperial Health Board ordered it to be kept in all the pharmacies of the empire; English physicians in India averred that by it they effected cures they were unable to effect by the simple drug. But unfortunately for him sufficient pressure was brought to bear to induce him to divulge his recipe, and at once its sale fell off and shortly almost altogether ceased. Everybody said: Oh, is that all —quinine with a little aloes and aromatics. He died a comparatively poor man, and yet his combination had perhaps a certain amount of value. Compare him with Mr. Eno, of Eno's Fruit Salts, who died worth six million of dollars, or the self-dubbed Professor Holloway, vaunting the efficacy of his pills, and his ointment of turpentine and beeswax. He left money sufficient to found colleges for women and asylums for lunatics. Remember also Dr. Morrison and his pills of gamboge, colocynth, squills, cream of tartar and ginger—a pill such as my conscience and my knowledge of the action of drugs never would allow me to prescribe—and yet physicians, we are told, ordered them surreptitiously, and the English public swallowed them freely believing his wild statement, "that all diseases arise from one cause and therefore require but

one medicine; it follows that if Morrison's pills do not cure no other medicine on earth will, and infallibility belongs to God." In his days pills and statements were not sugar-coated but were made strong. Our modern proprietary humbugs cover their chaff with a little wheat and take care that their nostrums please the eye, tickle the palate, and gently stimulate the imagination by some suggestive name or statement.

It is also in my opinion reprehensible, and I do not think this is too strong a word to use, for the physician to countenance proprietary preparations of even official drugs. For the pharmacist the fact that he is obliged to keep such an innumerable array of proprietary preparations on his shelves, together with the special tablets and pills of not one but many large manufacturing houses, must demand a large cash outlay; an outlay for which the pharmacist must recoup himself out of the pockets of our patients. Such recouping eventually reacts against the profession.

Personally I do not think it makes any difference to my patients whether the tablets I order be made by Messrs. Brown or Messrs. Smith, provided that both manufacturers are careful and honourable, and supply pure drugs. The pharmacist should be held responsible for the large houses whose goods he dispenses. Very seldom indeed should the physician append the name of any manufacturing house to his prescriptions.

Another important fact which has to be recognized to-day is the number of new synthetic drugs which have been introduced to the profession by German manufacturing houses. A few of these have proved of very definite value, replacing many of our older drugs; the great majority of them, however, have proved failures. For the most part they are the by-products in the manufacture of other chemicals, especially of the aniline dye industry, and their introduction to the profession has been due to the very energetic business methods of our German *friends*! A few, especially the earlier ones, have come to us with their value attested by really careful research work in the experimental laboratory and by the observations of careful clinicians in the large German hospitals. Of late years, however, much of this work has evidently been of the most superficial character and the numerous large chemical industries of Germany have competed with one another for priority rights in flooding the markets of the world with new drugs of almost no value. All of these have had some sounding proprietary name indicative of their supposed action, to which was attached a scientific name to indicate profound chemical research.

A few of these new drugs were definitely appropriated from

the laboratories of both French and English chemists, the name given by the discoverer was changed and a newly coined one was patented and the medical profession paid the piper. You will remember that in 1894 hexamethylene-tetramine was synthetically made and its therapeutic value as an antiseptic announced by M. Albert Robin at the Academy of Medicine in Paris, under the name of formine. About ten years later under the German name of urotropine, with German patents, the same drug was introduced to the profession and was received without questioning by English, French, and American physicians, and the price demanded was paid; five times the price for which it could be made in an ordinary chemical laboratory.

This is but one example out of many. How was it accomplished? The German houses bought up, or ruined by underselling, all the chemical industries in France and Great Britain that either opposed them or stood in the way of their schemes. For the few years immediately preceding the war this synthetic drug business represented in Germany a modern trust in its most vicious manifestations. There were large chemical factories thriving on the past bounties given by a fostering government, large hospitals in which so-called clinical experiments could be made, high professors with sounding titles who did not hesitate to stoop to give certificates, and well paid medical journals which willingly published reports, long and many, calling attention to every new product.

The whole world still honours the perseverence and careful laboratory methods of Ehrlich in his search for a *therapia magna sterilisans* for syphilis. His 606 accomplished almost all, but yet not all that he claimed for it. It is far otherwise with many of the recent synthetic products which until the outbreak of the war were so sedulously brought to the notice of our profession in Canada and elsewhere. A short trial has shown that most of them are of little value and their introduction can only be regarded as a prostitution of laboratories, hospitals, and professors to commercial ends. Everywhere when science ceases to pursue truth for its own sake and becomes the poorly paid slave of commerce deterioration is, I fear, inevitable.

As I have mentioned, a number of these new synthetic drugs proved themselves of very definite value and replaced almost entirely many of our older drugs and their galenical preparations. Now, when our supply is cut short, we find ourselves in difficulty and appreciate how completely Germany in the chemical trade had made herself master of the situation. At present it is against the law to order or make use of any German wares, and under this law

falls the use of German made drugs and German patent names. On the other hand it has been questioned whether a pharmacist is at liberty to replace a substance ordered under its fancy German name by the same substance sold under its true scientific name. It is perhaps debatable, but the remedy is in our own hands. To-day quite a number of these really useful synthetic drugs are manufactured in England, France and Switzerland, and a few in Canada and the States, and have been placed on the market under their chemical names. It behoves us in writing our prescriptions to avoid the use of all patented names and to use only the name given in the *British Pharmacopœia*, or the chemical name. For this reason in prescribing we should write,

Acetanilid, not antifebrin;
Phenazone, not antipyrin;
Acetyl-salicylic acid, not aspirin;
Theobromine sodio-salicylate, not diuretin;
Methyl sulphonal, not trional;
Diacetyl-morphine, not heroin;
Barbitonum, not veronal;—and so forth.

The list is a long one.

Much more objectional even than the patented names of new synthetic drugs are the proprietary names representing the semi-secret and patented preparations of many large manufacturing drug houses, American, Canadian, and English. To these I have already referred, but desire to make one more protest against the prescribing of such nostrums by any well educated and right thinking physician. All use of such in prescriptions I regard as unethical, tending not to the honour but to the dishonour of our profession, and not to the advancement of true knowledge, but to the benumbing of research and as a retrogression towards the therapeutics of the dark ages.

When the war is over there is little doubt but that Germany will again make the attempt to dump large quantities of these drugs and chemicals in every civilized country with the hope of again ruining the chemical laboratories which to-day are trying to supply us with the synthetic drugs of which we stand in need. I must appeal to the patriotism of every physician to favour either the home made or the British made product. And to our government we would say that no industry is more important for our country than the development in all directions of its great resources by chemical research and no manufacturing houses are in greater need at the present of governmental protection than those which attempt to do for the development of Canada what large chemical laboratories and factories have done for the advancement and development of Germany.

THE SURGICAL TREATMENT OF GASTRIC AND DUODENAL ULCER

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MOST surgeons and physicians are agreed that immediate operation is the proper treatment for acute perforations involving the stomach or duodenum, for selected cases of hæmatemesis of the persistent and recurring type, when associated with a clear history of gastric or duodenal ulceration, and for pyloric stenosis or hour glass contraction of the stomach.

Such emergencies and surgical conditions are the result of well-known destructive lesions affecting selected areas in the upper alimentary tract. The early recognition—the cause—treatment—and the clinical and pathological course, which such ulcers take are, you will agree, still the subject for marked difference of opinion. I think much of this lack of agreement is due to the standpoint of the physician and surgeon, and to the latter's personal experience in the operating room.

A patient with a typical history of gastric or duodenal ulcer, corroborated by *x*-ray plates and chemical tests, is treated successfully by appropriate medical, dietetic and other means. The patient may or may not have recurrence, but if he does, is again benefitted or cured by treatment. Nevertheless, increasing surgical experience shows that some of these patients have not suffered at any time from ulceration of the stomach or duodenum, but have suffered from appendicitis or cholecystitis, and sometimes nothing can be found to explain the symptoms. At other times the ulcer is there and not healed in spite of the free interval.

The typical history of duodenal ulcer so graphically described by Moynihan, with its hunger-pain, belching of gas, hyperacidity, etc., was first described by Hartmann in 1899 under the term "pyloric syndrome." These symptoms are associated with pyloric spasm and may be present in gastric ulcer, cholecystitis and ap-

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pendicitis, and in other less well understood conditions. Probably no organ in the body is so readily disturbed reflexly as the stomach. If this fact were kept constantly in mind, there would be fewer mistakes in diagnosis to record. Many patients are treated for gastric ulcer who are suffering from incipient pulmonary tuberculosis, or a chronic or recurrent appendicitis.

The frequent coëxistence of appendicitis and cholecystitis has been recongized for years and the belief is growing that it is more than a mere casual relationship. Cholecystitis is a well recognized complication or sequel of typhoid fever; why should it not accompany a definite, infected lesion in the appendix when the spread of infection follows the same channels? If we accept the infective origin of gastric and duodenal ulceration—and it seems to be the most plausible offered—the statement that a definite attack of appendicitis immediately preceded the onset of digestive disturbances which eventuated in chronic ulceration of the stomach, as demonstrated by operation, is quite trustworthy.

Can chronic gastric or duodenal ulceration be cured by dieting and medical treatment? The answer is undoubtedly yes, as shown by healed scars. That medical treatment is successful in a *majority* of the cases treated is, however, very doubtful.

Experience teaches us, that relief from subjective symptoms does not imply cicatrization and epitheliation of the ulcer. Indeed, we have no means of determining with accuracy the size, shape, or even the depth of the ulcer. Active ulceration without any subjective symptoms may reveal its presence for the first time, either by an alarming hæmorrhage or by an acute perforation. Given the condition of chronic gastric or duodenal ulceration, the patient is in a much similar condition to one suffering from acute appendicitis. In the latter, resolution with complete or imperfect restoration of the tissues may occur, or ulceration, perforation, or gangrene with local or wide spread infection may take place. If we "wait and see" as was done in the early history of this disease, we learn which course the inflammatory process will take. Since the risks of operative treatment are infinitely less than the "wait and see" policy, the medical profession and the laity have chosen the safer course in the treatment of this particular disease.

In our general and special hospitals, marked deformity of the spine, and destruction with deformity of joints, though all too common still, are much more rare than they were fifteen or twenty years ago. This is mainly due to the earlier recognition, and prompt

and efficient surgical treatment applied to tuberculous disease of bone, in its incipient stage, before the joints have became actually involved. Efficient treatment should largely prevent pyloric stenosis—hour glass contraction—perforation—hæmorrhage, and, if we accept Moynihan and Mayo's statistics, cancer, the result of chronic ulceration.

I submit that a patient who is suffering from what is diagnosed as a gastric or duodenal ulcer, and who is not cured in three or four months and who suffers from two or more relapses, even if he is benefitted by medical treatment, should be subjected to an exploratory operation, so that the actual conditions present may be observed and, if possible, dealt with surgically. This, however, does not imply that the excision of an ulcer with or without a gastrojejunostomy performed successfully—that is that the patient recovers from his surgical operation—should be the "be all and end all" of his treatment. On the contrary, these cases should remain under medical supervision and care, until the physician in charge considers the case perfectly well. The majority of gastric and duodenal ulcers show an associated gastritis involving the mucous and submucous coats of limited or wide extent, well seen at operation. I feel certain that were this method in actual practice, the post-operative records and histories would show a very marked improvement. All experienced surgeons acknowledge that much needless and meddlesome surgery has been practised on this organ. Even the very elect confess to the undoing of their own surgical procedures, when operative intervention has made bad, worse. This, however, refers to the early days of gastric surgery, when gastrojejunostomy was regarded as a "cure all" for stomach distress—irrespective of its etiology.

Before discussing the operative procedures applicable to ulcer of these organs, I should like to refer for a moment to what may be termed "operative diagnosis". In many cases the evidence of ulceration is readily recognized on exposing the viscera and this is confirmed by palpation. In others the massive induration, dense adhesions and frequent extension of the ulceration into contiguous organs make the diagnosis one of extreme difficulty. Cancer is suspected, if the latter, it is inoperable, if simple ulceration, the patient may and quite often recovers.

I wish to speak, however, more particularly of suspected cases of duodenal ulcer, in which we get an unusually firm pyloric ring deeply congested, with a few veil-like adhesions covering it, often adherent to the gall bladder, or to a tag of omentum, but

where we fail to get definite duodenal induration—wherever a doubt exists—I think the duodenum ought to be opened and the interior explored. I am certain that I have erred in the past in regarding such a condition, the result solely of a localized peritonitis of gall bladder origin, as an ulcer, and treated it as such, without benefit to the individual.

Finally, if no duodenal or gastric ulceration can be clearly demonstrated, a most careful examination of the abdomen should be made for evidence of disease elsewhere—in the appendix, gall bladder, pancreas, crippling adhesions or kinks, or the early evidence of intestinal or peritoneal tuberculosis.

If nothing tangible is found, there is nothing to do but close the abdomen and give the physician and operator an opportunity for further study and thought.

Perforation of a gastric or duodenal ulcer, with the exception of appendicitis, is the most frequent acute lesion of the abdomen. The intense agonizing epigastric pain and board-like, even retracted, abdomen in the early stage are almost pathognomonic of this lesion.

The mortality bears a direct relationship to early diagnosis and operative treatment. Preoperative treatment should be the exhibition of a full dose of morphia and the upright position. The perforation, exposed by a suitable incision, determined by the clinical history, should be closed by through and through catgut sutures, supplemented by a row of Lembert silk sutures, and if necessary, covered by an omental graft or by the gall bladder. Avoid, if possible, tube drainage, especially in duodenal perforations.

When the lumen of the pyloric antrum, pylorus or duodenum is seriously encroached upon by the infolding, add a gastrojejunostomy; otherwise this is unnecessary as a rule, and unduly prolongs the operation. Sponge out the upper abdomen carefully. Insert a rubber tube, through a stab wound above the pubis, into the pelvis, and close the abdominal wound completely. In late cases or where much gross stomach contents have escaped, more thorough cleansing must be employed.

Gastric Hæmorrhage

Severe, profuse, recurring hæmorrhages, without a definite history of chronic gastric ulcer, are usually due to gastric erosion or hæmorrhagic gastritis, and in my opinion should never be subjected to surgical treatment. If rest, morphia, horse serum or blood transfusions combined with very hot gastric lavage, and

adrenalin in suitable doses, fail to save, then surgery is of little avail.

Persistent, recurring hæmorrhages associated with a definite ulcer history should be dealt with surgically—during a free interval. Excision of the ulcer, with ligation of vessels and suturing of the wound, is ideal when practicable. Tying the bleeding point, as a rule, is impossible.

The application of the cherry red cautery point is not quite satisfactory. A circular purse string suture with subsequent infolding is quite efficacious, in some cases, when applicable.

Pyloric stenosis requires gastrojejunostomy and this, irrespective of the exact site of cicatricial contraction. I have used both iso- and anti-peristaltic anastomosis with equally good results.

Keeping in mind the experimental work done by Drs. Archibald and Scrimger, I have aimed at getting the stoma as close to the pylorus as the ulceration would allow. Besides I have tried to determine the usefulness and value of pyloric occlusion, by infolding—fascial bands, pylorectomy, etc. Since using the fascial band and forming the stoma close to the pylorus, I am certain that patients have had more vomiting and a greater tendency to post-operative bleeding, then was formerly the case.

For the treatment of gastric ulcer not situated at or near the pylorus there is no unanimity of opinion. Many think gastrojejunostomy sufficient, others recommend resection, especially for the saddle-shaped or single anterior and posterior ulcers situated within easy reach.

For high lying ulcers Balfour's method of complete destruction with the cautery, followed by suture, seems to offer excellent results and will probably be more generally employed in the future.

For massive ulcers occupying the prepyloric region, complete excision with closure of each end and gastrojejunostomy, Rodman's operation (i.e., pylorectomy) gives ideal results, often with less post-operative disturbance than follows a simple gastrojejunostomy. Hour-glass contraction should be excised if possible, if active ulceration is still present, and an end to end anastomosis effected. When no active ulceration exists, as in one of my cases, a Heinicke-Mikulicz operation with gastrojejunostomy gave good results.

Gastrogastrostomy and a double gastrojejunostomy have been used with success.

Recurrence of ulcer: Both perforation and severe hæmorrhage have followed gastrojejunostomy.

A new ulcer has developed after the successful surgical treat-

ment of a chronic one. Most of these have occurred at or about the site of anastomosis.

They have been reported most frequently following Roux' operation, in which the beneficial effects of duodenal secretion bathing the site of anastomosis are absent.

They have occurred with especial frequency experimentally and clinically when silk has been used for the hæmostatic suture. W. Mayo thinks the continuous silk Lembert suture favours this complication and recommends the interrupted suture instead. A return of gastric symptoms after a period of relief following operation should suggest the possibility of this complication—a serious one, since death may take place from perforation or hæmorrhage.

Statistics

The present series of cases dealt with during the last two years has been arbitrarily chosen for review, because during this period I have been employing the fascial band for exclusion, in selected cases. Twenty-two cases in all—twelve of which were regarded as distinctly duodenal and ten as gastric, and in the majority of cases close to the pylorus or involving the pyloric region.

Of the twelve duodenal cases, nine came to operation. In one case, previously operated on for perforation by Dr. Keenan, there was a recurrence of the indigestion, disability and weakness. The average of all ages was 46⅔ years. Seventy-five per cent. were males—25 per cent. females. All gave a history of indigestion lasting more than one year. In two cases digestive disturbance had existed off and on for twenty years. The shortest period was two years. One case had suffered for fifteen and another for eight years.

Pain was the prominent symptom in all, chiefly epigastric in eight, the upper abdomen in three, the right side in one. Definite hunger-pain was complained of by seven. In one food aggravated the pain. Only three had marked radiation of the pain. Hæmatemesis and melæna occurred in three and occult blood in one other, that is in about 25 per cent. of cases.

These statistics refer to the nine cases which came to operation.

Chemical and microscopical examination of a test meal was made in a certain number of these cases.

In the gastric ulcers, seven came to operation out of ten cases so diagnosed.

In one the ulcer on the lesser curve midway between the pylorus and œsophageal opening, was treated by resection.

In one a saddle shaped ulcer occupying a similar position was also resected.

In one on the posterior aspect of the antrum close to the pylorus, a very indurated and adherent ulcer was treated by gastrojejunostomy and a fascial band, proximal to the ulcer.

In one situated on the anterior wall, in the pyloric region—indurated and perforated, closure, without gastrojejunostomy.

In one on the posterior wall, rather nearer the lesser than the greater curve—excised.

In one, a bilocular stomach due to a healed encircling ulcer, and associated with an indurated ulcer on the posterior wall of the duodenum, which was still active and adherent to the head of the pancreas, was treated by the application of the Heinicke-Mikulicz principle, a gastrojejunostomy and a temporary jejunostomy to facilitate early feeding.

One ulcer, on the lesser curvature, situated high up towards the œsophagus, gave me considerable difficulty in resecting it, and in subsequently closing the wound, owing to the narrow epigastric angle.

Gastric Ulcers

The average age of these cases was $33\frac{1}{3}$ years. $66\frac{2}{3}$ per cent. were males and $33\frac{1}{3}$ per cent. females. Four had a history of less than one year.

One with perforation gave a history of indigestion lasting but two weeks, treated by "dieting", which consisted in eating chiefly pie and raw apples. The patient declared he never had pain in his abdomen, nor any symptoms of indigestion prior to that period.

Six gave a history of more than one year, and one of twelve years or more.

All had pain in the epigastrium more or less severe. Seven gave a distinct and repeated relation to the taking of food, four of these within one and a half hours of eating, and three two hours or later.

In two there was repeated history of hæmatemesis—in three, melæna. In only one was occult blood found in the stools. *X*-ray examinations corroborated the clinical diagnosis in those cases in which they were employed.

The complications following surgical treatment in the duodenal cases have been unusually high.

In five cases there was vomiting coming on at varying intervals —consisting of dark brown, greenish, or bloody fluid.

In two obstruction was demonstrated by means of *x*-ray plates

and the barium meal, and I am indebted to Dr. Martin for the timely use of this means of diagnosis in the first case, which had many of the ear-marks of acute dilatation, and which I thought it was. Both of these will be referred to later. Both required a second operation, which shall also be discussed.

A fascial band was employed in six cases. Three made an uneventful recovery and three had marked and early vomiting.

There were two cases of pleurisy; one dry and the other with effusion.

There was one death from pneumonia.

The complications in the gastric ulcers were insignificant, with one exception. The ulcer was situated at or about the pylorus. Gastrojejunostomy was performed, and a proximal fascial band was applied. Acute dilatation of the stomach with persistent oozing of blood supervened, as was demonstrated in performing gastrostomy for its relief. The patient made a good recovery.

Report of Cases

Several of these cases present points of interest either from the clinical or from the operative standpoint, and merit more extended notice.

Case 1. Mrs. B., aged forty-four, referred by Dr. Mulloy, complained of epigastric pain, marked constipation, and of frequent coffee ground vomiting. In the hospital there was no melæna and no evidence of occult blood in the stools. She was tender in the epigastrium and right hypochondrium. Fluoroscopic and *x*-ray plate examinations showed a bilocular stomach and the evidence of a duodenal ulcer.

At operation a transverse incision through the hour-glass constriction revealed complete healing of the encircling ulcer. This incision was extended widely into the proximal and distal pouches, and then sutured vertically as in a Heinicke-Mikulicz pyloroplasty. The deeply excavated duodenal ulcer adherent to the head of the pancreas, causing considerable stenosis, was left alone, but a gastrojejunostomy was established at the proximal pouch. To facilitate early feeding and to give the stomach a period of complete rest, a jejunostomy was done; the tube was removed on the twelfth day, when the patient was taking soft food and liquids by the mouth. She made a slow but steady recovery and left the hospital gaining steadily in health, strength and weight, with a good appetite and free from pain.

Case 2. R. E., thirty-one years old, referred by Dr. Elliott,

of Scotstown, complained of epigastric pain, tarry stools, weakness, belching of gas. There was a history of attacks of indigestion for eight years. These attacks were worse in the fall of the year and were attributed to eating apples. All attacks were relieved more or less quickly by dieting.

At operation an excavated indurated ulcer, adherent to the head of the pancreas, and about an inch from the pylorus, was found. Gastrojejunostomy and the application of a fascial band, proximal to the ulcer, were employed. That night and the following day the patient vomited on several occasions large quantities of thin, bright red fluid. Lavage with hot water and the use of adrenalin and horse serum gave no permanent relief to his symptoms. Lavage, while giving temporary relief to the gastric symptoms, induced such weakness and exhaustion that it was discontinued.

Forty-eight hours after operation, under local anæsthesia, a two inch left subcostal incision was made revealing an enormously distended stomach. Gastrostomy was performed using a Pezzer catheter of large calibre, giving exit to a larger quantity of foul smelling gas and dark red bloody fluid. The stomach was washed clean, through the tube, and adrenalin and horse serum employed from time to time. The tube was left open and drained away small quantities of foul smelling bloody fluid. Vomiting was immediately arrested. On the third day four ounces of blood were transfused from his sister and six hours later gastric drainage ceased to be bloody. The tube was removed on the fifth day.

For the first five days nutrient enemata and intravenous salines were employed, but from that time on food was given by mouth. The patient left the hospital on the fifth week in good condition and has made a very satisfactory recovery.

A few weeks later I operated on a younger brother, removing a deeply excavated ulcer, near the lesser curvature, but on the posterior wall of the stomach. He made an uneventful recovery.

Dr. Elliott later informed me that there was a distinct history of hæmophilia in the family, and that five immediate relatives had died from gastric or intestinal hæmorrhage.

Case 3. E. R., aged forty-eight. This patient gave a history of recurring attacks of pain in the epigastrium or lower thorax, aggravated by exertion or hard work. Vomiting and belching of gas relieved the pain. There was no history of hæmatemesis or melæna, but occult blood was found in the stools. These attacks had recurred so frequently and lasted so long during the last two years that he has been compelled to give up his trade. From fluoroscopic and rœntgenographic examinations, Dr. Cheney reported the

probability of a duodenal ulcer, thus corroborating the diagnosis made from the clinical history.

At operation, the antrum, pylorus and first portion of the duodenum seemed to be perfectly normal. The pylorus admitted the end of my index finger. There was no adhesion or congestion of the peritoneal coat, and no induration. Dr. Armstrong saw the condition at operation. The abdomen was carefully explored but nothing abnormal was found. I decided to open the duodenum for inspection and found two sharply punched out ulcers (contact), one on the anterior and the other on the posterior wall. Each could easily hold half of a large green pea. The surrounding mucosa was soft, plush-like, and deeply congested, but not indurated in the slightest degree. Gastrojejunostomy was performed and a fascial band applied. The patient during convalescence developed a dry pleurisy, but left the hospital on the thirteenth day well, with a good appetite and free from all epigastric distress.

Case 4. W. M., aged fifty, was referred by Dr. Nelson with a history of chronic indigestion, pain, hæmatemesis and melæna.

Dr. Martin recommended surgical interference. At operation an indurated duodenal ulcer was treated by gastrojejunostomy. Convalescence was smooth until the ninth day when he began vomiting small quantities of thin brownish-green fluid. There was no pain. The epigrastrium was full and he complained of intense thirst. The passage of the stomach tube gave exit to large quantities of thin fluid, corroborating the diagnosis of acute dilatation which had been made, and gastric lavage gave immediate, but only temporary relief.

Dr. Martin recommended a barium meal and *x*-ray plates. This showed that barium left the stomach by the stoma, but was arrested about six inches from the anastomosis. A second operation revealed an acute kink of the distal loop of the jejunum which was readily corrected. Jejunostomy was performed to facilitate feeding and give the stomach complete rest. The tube was removed on the ninth day and the patient subsequently made a very good recovery. He has steadily gained in weight, strength, and well being, and is free from indigestion at the present writing.

Case 5. L. L., aged forty-three, referred by Dr. Hamilton, gave a history of hæmatemesis, melæna and indigestion.

Gastrojejunostomy was performed for a duodenal ulcer situated on the posterior wall. No fascial band was employed. The patient vomited some blood for the first twenty-four hours following operation, and had in addition persistent high fever with

gradual increase of pulse rate. Pneumonia was suspected but its location could not be demonstrated by physical signs. At the end of forty-eight hours the condition was desperate, but he improved rapidly after an intravenous of saline and adrenalin chloride. The improvement continued for the fourth and fifth days in spite of the fever and rapid pulse, the patient taking nourishment in the form of albumen-water, and sterile broth in abundance. There was no vomiting, no pain, and practically no cough. Towards the evening of the fifth day the alarming symptoms of the second day returned and, in spite of the intravenous salines, the patient died on the morning of the sixth day.

Autospy revealed an extensive patchy consolidation of the left lung. This is the only death in the series reported.

Case 6. W. S., referred by Dr. Conroy, gave a typical history of duodenal ulcer which was readily demonstrated at operation.

The duodenum was markedly dilated although the jejunum was contracted. The duodeno-jejunal junction seemed to lie farther to the right and lower than normal. Otherwise no other cause was found to explain this condition.

Gastrojejunostomy was performed. In addition to the dilated duodenum the stomach was ptosed and dilated. Recovery was ideal until the fifth day when the patient began vomiting. The stomach tube revealed a dilated stomach and gastric lavage with rectal feeding gave immediate relief. On returning to gastric feeding vomiting returned and a barium meal with *x*-ray plates showed that no material passed out of the stomach.

On the tenth day a second operation showed no adhesion but a twisting of the proximal and distal loops of jejunum to the right, with some contraction and thickening of the opening in the transverse meso-colon. The stomach occupied a much higher level than at the first operation. The narrowed ring was cut, the twist undone and maintained by two or three sutures and a jejunostomy performed. The tube was removed at the end of twelve days, since which careful dieting has not been followed by any vomiting.

Case 7. Dr. B., aged fifty-one, referred by Dr. Hamilton. This case illustrated another interesting complication in which duodenal ulceration in an active condition coëxisted with cholelithiasis. The previous history was that of painful epigastric attacks, flatulence, melæna, but no hæmatemesis.

At operation a chronic duodenal ulcer with marked induration, occupied the posterior wall just beyond the pylorus, but in addition there was an acutely inflamed gall bladder containing many

stones. Gastrojejunostomy was performed and then the gall bladder was opened and the stones removed, but a small stone encysted in the cystic duct could not be dislodged. The bladder was drained and finally the fistula allowed to close.

As was expected, in a few months there occurred a sharp attack of pain with fever, chills, etc., and a localized swelling due to acute purulent cholecystitis. At a second operation cholecystectomy was performed. The patient has made an excellent recovery, gaining in weight, health and strength, and with complete freedom from gastric disturbance.

The writer is indebted to Dr. Melhado for valuable assistance in collecting and preparing the statistics in the cases recorded.

At a meeting of the Calgary Hospitals Board on May 17th, a discussion took place as to whether the public wards of the General Hospital should be made free to residents of Calgary. This proposal was made by Mr. E. H. Riley, who contended that the financial loss incurred by such a change would not amount to more than $10,000 a year, and that free wards would offer better accommodation and would conduce to the peace of mind of those patients who are unable to pay . The concensus of opinion, especially amongst members of the profession, was against such a departure on the grounds that, under the present arrangement, non-paying patients receive exactly the same treatment as those who pay and no one except the members of the office staff knows whether they pay or not, that 20 per cent. of the total revenue from patients would thus be lost and the amount would have to be added to the general taxes, a procedure not to be advocated at the present time. Consequently, it was moved by Mr. J. H. Woods and seconded by Mr. E. G. Pescod, "That in the opinion of this Board the present financial conditions existing render it inadvisable and practically impossible to impose any further burden on the taxpayers of the city of Calgary by making free the public wards of the Calgary General Hospital." This motion was carried, Mr. Riley casting the only dissenting vote.

THE OPERATIVE TREATMENT OF SIMPLE FRACTURES

By E. R. Secord, M.D., C.M., F.A.C.S.,

Surgeon to the Brantford General Hospital, Brantford, Canada

IN 1894, Sir Arbuthnot Lane delivered an address before the Clinical Society of London, in the course of which he made the following statements:

1. That accurate, or anything approaching accurate, apposition of displaced fragments in a fracture, was only very rarely obtained.

2. That the treatment of fractures, as it existed, was a disgrace to surgical practice, because those who had sustained fractures, especially of the leg, only too often experienced enormous physical disability.

He advocated the treatment of simple fractures of the long bones by operative measures, for the following reasons:

1. They at once relieve the patient from the pain produced by any movement of the fragments upon one another.

2. They free him from the tension and discomfort, due to the extensive extravasation of blood, between and into the tissues.

3. They shorten the duration of the period during which he is incapacitated from work.

4. Lastly and most important, they leave his skeletal mechanics in the condition in which they were before he sustained the injury.

The operative treatment of simple fractures met with the most violent opposition for many years, until in 1912, the British Medical Association appointed a committee "to report on the ultimate results obtained, in the treatment of fractures, with or without operation."

The report of this committee may be briefly summarized as follows:

1. In children, non-operative methods show a high percentage

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of good results, except in fractures of both bones of the forearm. Operative methods show equally good results.

2. In comparison, the results, in those over fifteen years of age, by non-operative treatment, are not satisfactory.

3. There is a progressive depreciation of the functional result, by non-operative methods, as age advances—the older the patient, the worse the result.

4. In cases treated by early operation, the deleterious influence of age upon the functional result is less marked.

5. In nearly all age groups, operative cases show a higher percentage of good results than non-operative cases.

6. Although the functional result may be good with an indifferent anatomical result, the most certain way to obtain a good functional result, is to secure a good anatomical result.

7. No method, whether operative or non-operative, which does not definitely promise a good anatomical result, should be accepted as the method of choice.

8. The mortality directly due to the operative treatment of simple fractures of the long bones has been found to be so small, that it cannot be urged as a sufficient reason against operative treatment.

Methods of Operative Treatment

If then, we are prepared to accept the findings of this committee, we must conclude that the final results are better, in fractures of the long bones in adults, when treated by operative rather than by non-operative methods.

These methods have varied somewhat with the exact site of the fracture, but up till recently have consisted in an open incision over the fracture, the accurate replacement of the fragments in exact alignment, the temporary retention in this position by traction, manual or otherwise, assisted by specially devised forceps for grasping and holding the bone ends, and permanent fixation by the application of one or more steel plates, with two or more holes at each end, through which screws are driven into the bone, beyond the fracture line, thus holding the fragments firmly in place. In certain localities, staples, steel nails, screws, and occasionally silver wire may be more advantageously used.

Within the last two years considerable antagonism has developed towards the use of these foreign bodies, which are left in the tissues. Many articles have been written claiming that they do not attain their object, that they bend or break, that the screw

works loose through a process of rarefying osteitis, that a low grade infection is set up which subsequently demands the removal of the plate, and some writers have gone so far as to condemn entirely the use of "hardware" in any form.

Albee, of the Post-Graduate Hospital in New York, may probably be called the leader in this school of thought. He advocates the use of autogenous bone grafts to unite the fractured ends and keep them in alignment, and he practically never uses metal. His method consists in the insertion of an "inlay graft," either by "sliding" from the bone above the fracture, or by transference from some other bone, preferably the tibia.

After an experience of a considerable number of cases, in which both methods were tried, I am thoroughly convinced that the trend of surgical opinion and practice, for this particular type of case—that is the operative treatment of recent fractures—will be away from the graft and back to the plate. I have conversed with several surgeons, who have tried the "sliding graft" in a number of cases, and have yet to find one who is fully satisfied with it, Gallie, of Toronto, has given up this method entirely, and is experimenting with heterogenous bone plates, and bone screws, with the idea of being able to use absorbable material instead of metal. Some success has crowned his work, and his method may find a place in the treatment of certain fractures, especially in children. Armstrong, of Montreal, has used an ox femur, sawn transversely into rings of various sizes, one of which may be slipped over the fractured ends, thus forming an internal splint which holds the fragments in place.

This is not the place to enter into a discussion of the relative merits of the autogenous, and heterogenous bone graft. Suffice it to say that, in my opinion, the autogenous graft is far superior in the vast majority of cases where a graft is indicated, but in the treatment of *recent* fractures the graft is rarely indicated, and the steel plate remains the method of choice.

The chief objections to the "inlay graft" method are:

1. The great amount of manipulation necessary to obtain and place the graft, the greater area of bone exposed, and the increased disturbance of the neighbouring muscular attachments.

2. The difficulty of accurately retaining the graft in place or in other words the comparatively small amount of force which will dislodge it from its bed.

Albee's plans and diagrams are very ingenious, and look wonderfully well—on paper, but he depends for retention on kangaroo

Fig. 1—"Skinner's Unsatisfactory result of reduction of same by non-means.
"The entire Styloid Process dapping of Fibular fragis distal to a line which is dradiographed through Plasthe tip of the Ulnar Styls Cast.
angles to the long axis of

Fig. 3—Fracture at junctie, Antero-Poster.or View.
upper and middle thirds of Frfect contour of the Tibia,
Usual deformity. use of a Plate.

Fig. 1—"Skinner's Lines"
"The entire Styloid Process of the Radius is distal to a line which is drawn through the tip of the Ulnar Styloid at right angles to the long axis of the Radius."

Fig. 2—Result of Fracture of Patella, in a male aged 73, five weeks after "Wiring."

Fig. 5—Fracture of Tibia and Fibula by direct violence.

Fig. 6—Unsatisfactory result of attempt at reduction of same by non-operative means.
Note overlapping of Fibular fragments. Radiographed through Plaster of Paris Cast.

Fig. 3—Fracture at junction of upper and middle thirds of Femur. Usual deformity.

Fig. 4—Result in same case six weeks after operation.

Fig. 7—Result after operation, with plate on the Fibula.

Fig. 8—Same, Antero-Posterior View. Note the perfect contour of the Tibia, without the use of a Plate.

tendon, passed either through drill holes in the bone, or through the periosteum alone. We have found repeatedly that though the kangaroo tendon itself is strong enough and perfect in every respect, it frequently breaks when tied with any degree of tension, because it cuts on the sharp edge of the drill hole in the bone.

I am of the opinion that the great majority of the failures in the use of the steel plates arise from defective technique, and I would lay great stress on the danger of the words "internal fixation" as applied to the operative treatment of fractures. I believe that the same care should be exercised in the application of retentive apparatus after a fracture has been plated, as when this has not been done, and I feel that it is the omission of this precaution that has resulted in the reports of cases of loose, bent, or broken plates, and loosening screws. It is well known that bone will absorb under pressure, and if the screws, holding the plates in position, are subjected to strain, they will undoubtedly sooner or later work loose, by the very process of rarefying osteitis, which has been blamed on the screws themselves. Lane says that rarefying osteitis means in plain English "dirty surgery", and it probably does so in many cases, but undue tension on the screw thread will undoubtedly cause the screw to loosen. My belief, therefore, is that the best method of operative treatment of recent fractures is the steel plate, properly applied, followed by accurate closure of the wound, with the use of continuous iodine catgut for the skin, so that a plaster of paris bandage may be immediately applied, and left on until such a degree of bony union has been secured, that it may be safely removed. The use of the Hawley Traction Table, or of some other method for securing steady and continuous traction, is of very great assistance in maintaining the limb in proper position until the plaster splint is in place.

Whatever the final decision may be in these debated problems, of one thing I am sure, and that is that the degree of surgical asepsis which permits a successful abdominal operation, will not answer for successful bone work. The surgeons of the largest experience in every country are laying more and more stress on this point. Lane is particularly emphatic in maintaining that the surgeon's hand, always gloved, must never come in contact with the wound, or bone, nor must any instrument which has been in contact with the skin. Murphy, of Chicago, is equally insistent that there must be no hand contacting in bone operations. Special instruments are therefore of great assistance, and I have found the bone plate holder, and the screw holding screw driver invaluable.

Case Reports

PENETRATING GASTRIC ULCER WITH SPECIMEN

By E. M. von Eberts

THE pathological specimen is from a female, aged fifty, who was admitted to the Montreal General Hospital on February 12th, complaining of "vomiting, indigestion, and distress after eating". There was nothing in the family or personal history of interest. The illness dated back twenty-eight years, when she had had an attack of vomiting, with pain in the epigastrium, the symptoms lasting for about four months. Subsequently there were recurrences of these symptoms at periods varying from eight months to a year, each attack lasting three or four months. The attack for which she entered hospital began on December 23rd, with pain in the upper abdomen and the vomiting of a quantity of dark brown material after taking food. Within twenty-four hours the bowel movement showed the presence of a large quantity of altered blood. The symptoms were all classical of peptic ulcer, that is, distress or feeling of weight in the epigastrium half to one hour after taking food, relieved by vomiting and by alkalies. These attacks lasted for two or three months, and then for a period of six months the patient would be free from symptoms. There was no nocturnal pain. The bowels throughout the twenty-eight years were persistently constipated.

When the patient entered hospital, there was found on examination tenderness close under the ribs on the left side. Pain, when present, was referred to a corresponding point in the back. Ewalds' test meal was given, and at the end of one hour 100 c.c. of residue of a brownish yellow colour was withdrawn, containing both macroscopic and microscopic blood. *X*-ray examination showed marked six-hour retention. It was considered that the case was one of peptic ulcer of the fundal portion of the stomach, most likely involving the posterior wall, as the pain was referred to the spine. Curiously, in view of the subsequent findings, the

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x-ray failed to show any bismuth deposit in the wall of the stomach.

An operation was performed on February 17th. When the abdomen was opened, the crater of a large penetrating ulcer on the posterior wall of the stomach could be felt, the opening into the perigastric space admitting the tip of the forefinger and the invaginated anterior wall of the stomach. A large perigastric mass was adherent to the pancreas. It was thought inadvisable to attempt to deal directly with the ulcer, and the ordinary no-loop posterior gastro-enterostomy was performed.

The patient made a good recovery from the operation. On the third day after operation the temperature was normal; pulse 96; and it was considered that convalescence was established. However, at noon on the fourth day the temperature rose to 101 2/5°; the pulse to 120. Subsequent enemas were all effectual, but the patient rapidly sank, and died at four o'clock on the following day.

At autopsy there was found a general peritonitis, due primarily to perforation of the ulcer into the lesser peritoneal sac.

It is the consensus of opinion that one should not attempt to excise a penetrating ulcer of this extent involving, as this did, the pancreas in the perigastric adhesions, but that one should do a gastro-enterostomy in order to permit the entrance into the stomach of the alkaline pancreatic and biliary fluids, and in that way overcome the hyperacidity and promote healing.

Living Case: Congenital Pyloric Stenosis.

The case is that of a child of five weeks admitted to hospital February 10th. The child was born January 4th; normal pregnancy; normal delivery; the third baby; breast fed entirely. The present illness started at the end of the third week. After feeding the baby appeared to have pain in the abdomen, crying and drawing up the legs. The distress was only present for a short time, but recurred after each feeding. About this time the child began to vomit, and for several days before admission usually ejected the whole of the amount taken. The child had always been constipated, requiring a dose of olive oil every other day. On admission the child appeared to be well nourished and fairly well developed; cried a good deal, but did not appear to be in pain. The abdomen, when the child was lying quetly, showed no visible peristalsis. On palpation there appeared to be an elongated and freely movable mass to the right of the median line, above the umbilicus. This tumour was quite smooth; the long axis was placed in the horizontal

direction. The liver was palpable; the spleen was not palpable. It was thought that the child was suffering from intussusception. However, a copious high enema resulted in the passage of some flatus and a slight amount of fæcal matter. The tumour disappeared. An hour later the child took the breast without subsequent vomiting. On the following day there was a healthy bowel movement in the morning, containing neither blood nor mucous. No tumour could be felt and the patient was discharged on February 11th, with instructions to the mother to bring the baby back for further observation. On the 14th the child was re-admitted. It had remained free from symptoms for a short time only after leaving the hospital; the bowels had not moved since. The child had nursed quite well for the first day, but for twenty-four hours before re-admission the previous symptoms had returned. The vomitus consisted entirely of milk; there was no fæcal vomiting at any time. On re-admission there was observed marked peristalsis in the upper portion of the abdomen, starting from the left subcostal margin and passing to the right. The tumour previously noted could not be felt. The abdominal wall was soft; no apparent tenderness; child quiet under examination. On February 15th, the patient had an emema of plain water, which was expelled with small masses of hard, constipated stool; a soap-suds enema was more effectual, bringing away a large mass of dark formed stool; and a third enema was still more effectual. On the 16th the child showed the first signs of exhaustion, that is the periodical occurrence of symptoms of partial collapse, which is always a danger signal in these cases. The patient appeared very weak; the respirations were of the Cheyne-Stokes type with short periods of apnœa; temperature 101 4/5°; pulse 140. It was realized that the condition was due to pyloric obstruction, although some of the classical symptoms of congenital pyloric stenosis, such as expulsile vomiting, had been absent. It was decided to open the abdomen at once.

When the abdomen was opened, the stomach was found to be enlarged, and the pylorus occupied by a firm muscular mass, estimated to be the size of the terminal phalanx of the ring finger. A posterior gastro-enterostomy was performed. The child made an uninterrupted recovery.

Editorial

THE ASSOCIATION

FOR various reasons, of which the most important was the enlistment of the Editor and the Secretary-Treasurer for overseas service, no report on the work of the Association for the year 1914 has as yet reached our members.

The last report published appeared in the September number for 1914, and we would remind our members that the financial statement for the year 1913 which accompanied this report showed a deficit of some two hundred dollars. The general condition of the Association appeared to be sound and the hope was expressed in the report that the year 1914 would see a surplus in place of this deficit. As a matter of fact, however, owing to various causes, the deficit was increased for 1914 to something over seven hundred dollars. The principal reasons for this additional loss were the comparatively small receipts at the St. John meeting and the loss of members through enlistment for service in the war.

With this deficit to face it was at once apparent, when the officers of the Association left for the front, that it would be impossible to continue the payment of their salaries to their successors and still keep the Association solvent.

It was also practically certain that a further loss of members would occur in 1915 through enlistment and that our finances would suffer correspondingly, and if we add to this the loss of receipts through postponement of the annual meeting it will readily be seen that the financial outlook was not bright.

It will be noted that the 1915 statement (published in this issue) shows a small surplus, but this was only obtained by reason of the services of the Acting Officers being given

gratuitously, the saving thus effected being about fifteen hundred dollars. This may appear satisfactory in so far as the actual condition of the treasury is concerned, but it is far from satisfactory if one looks at the general position of the Association.

At a meeting of the Executive Council held in Toronto June 2nd, of this year, two important questions were discussed. First, the financial condition of the Association, and second, the question of holding the annual meeting in 1917.

The postponement of the meeting of 1915 would appear to have been, for many reasons, the wisest course, and it was difficult under existing conditions to arouse enthusiasm for a meeting in 1916, so that this also was deferred, although suggestions that it be held in the East were made.

It is now becoming abundantly apparent that any further postponement will be highly detrimental to the interests of the Association. Upon the papers presented at the annual meeting the JOURNAL depends largely for its material, and the Association looks to it also for a considerable part of its revenue. But apart from these two very excellent reasons there still remains the great need of acquiring new members and the desirability of stimulating the enthusiasm of the old. If the Association is to continue we must have new members.

It has been decided therefore to hold a meeting in 1917, and it behooves every one of our members to begin now and plan what he individually may be able to do to make it a success. The time and place of the meeting will be announced later.

We would bespeak a careful perusal of the financial statements for the years 1914 and 1915 which will be found elsewhere in this JOURNAL.

No credit can be claimed by the Association for the existence of a small balance at the end of 1915. An important body like the Canadian Medical Association should be able to pay its officers adequate salaries, and it is apparent that this cannot be done under existing conditions.

REPORT OF THE SPECIAL ADVISORY COMMITTEE ON CEREBRO-SPINAL FEVER

THE "Report of the Special Advisory Committee upon Bacteriological Studies of Cerebro-Spinal Fever during the Epidemic of 1915," approved for publication by the Medical Research Committee of Great Britain in January, 1916, has just come to hand and makes interesting reading. It is an analysis and summary of twenty-four reports sent in from central and provincial cerebro-spinal fever laboratories established by the War Office, and refers, in addition, to the work of the Local Government Board laboratories and to various papers published in 1915 dealing with cerebro-spinal fever and its causal organism. The report confines itself mostly to bacteriological questions of a quite technical character, but sections on the larger questions of epidemiology and diagnosis, and a short review of the serum treatment, are included. The Committee asked for information particularly upon the following points: (1) Mode of spread of the disease. (2) Contacts. (3) Carriers. (4) Incubation period, diagnosis, and specific treatment of cases of cerebro-spinal fever.

The specificity of the meningococcus is affirmed and "pleomorphism" denied, the biological characters of the other Gram-negative cocci of the upper respiratory tract being sufficient to differentiate these from the meningococcus. It is pointed out, however, that there is strong evidence in favour of "immunological races," or strains, of the meningococcus, and that there are two principal "epidemic types" which are responsible for at least 80 per cent. of the cases in the recent epidemic. It is hoped that these observations will result in the production of efficient homologous sera for the recognition and treatment of the principal types of meningococcal infection. The reporters are practically unanimous in affirming that the diagnosis of cerebro-spinal fever from examination of the cerebro-spinal fluid is trust-

worthy, when both microscopic examination and cultures are employed. Failure to find the organism may occur in fulminant cases, in the earliest stages of ordinary attacks, in abortive cases, in the later stages of chronic cases, and sometimes after intraspinal injections of antimeningococcal serum. Blood cultures appear to have been seldom made, and the routine examinations of the pharynx for meningococci was not carried out with the same thoroughness as the examination of the spinal exudate. The Committee thinks that there is need of fuller data in both of these matters. On the other hand routine examination of the pharynx of "contacts" with cases of cerebro-spinal fever has been practised by the majority of the reporters for the purpose of detecting carriers. The important conclusions in this respect are that immediate cultures from the swabs are essential to success, as drying soon destroys the vitality of the organism, and that salivary contamination must be avoided preferably by the use of a curved protecting tube. The Committee thinks that with such precautions the method will give better results than those reported, and is essential for determining the mode of spread of the disease and the possibility of its control. The conditions which favour "positive contacts" are chiefly overcrowding and insufficient ventilation of rooms, especially if used for meals. A plea is made for a widespread "carrier census" among the population at large, in non-epidemic as well as in epidemic years, for the purpose of clearing up the incidence of cerebro-spinal fever. From the statistics given there is evidently a wide variation in the duration of the carrier condition in different individuals, but the majority are free from infection in a week to ten days. Naso-pharyngeal disease does not play any part in prolonging the duration of the carrier condition according to most of reporters, and no treatment—immunization, antiseptics, etc.—seems to have any appreciable effect. An open-air life appears to be the best remedy.

The section on epidemiology is specially interesting.

"The question is one of the transfer from pharynx to pharynx of an organism having little vitality and no power of growth outside the animal body, and is the same in principle as that involved in the spread of such diseases as influenza and common catarrhs." Two individuals who daily swabbed carriers, without wearing masks, gave positive swabs after ten and fourteen days respectively. As the meningococcus is present only in the posterior walls and pharynx, it is only in explosive expiration—coughing and sneezing—that there is any probability of transference directly from one individual to another, but table utensils may cause the infection indirectly.

The statement is made that the experience of the recent epidemic "appears to show that the risk of direct infection from case to case is seldom great." In Salisbury Plain "not a single person in attendance on the cases suffered and not a single nurse or hospital orderly became even a positive contact."

"*It may be concluded from these facts that the direct source of infection in cerebro-spinal meningitis is usually to be sought not in another case of the declared disease, but in the undeclared carrier.*" This is perhaps the most startling conclusion of the whole report. Among the accessory factors which favour the spread of cerebro-spinal fever are mentioned military movements, weather, overcrowding and deficient ventilation, fatigue, and other doubtful causes.

The only one which we need refer to is the first, as it directly concerns us. The statement is made that "the reports from the Salisbury Plain area suggest, not indeed that the Canadians imported a new disease into this country, for we have always had it with us in sporadic form, but that they did introduce a virulent strain of meningococcus and were in some degree responsible for its spread." Though coming from such an authoritative body as the Special Advisory Committee and published with the approval of the Medical Research Committee, it may be questioned whether

the "suggestion" is really one which was entitled to be made on the basis of the facts recorded. It is admitted in the report that "we (in England) have always had it in a sporadic form", and it is also true that culturally no difference has been detected between the strains isolated from Canadian cases and British cases. All the strains recognised by Arkwright and Ellis have been found in Canadian and British cases. It is quite possible that members of the same strain may exhibit different grades of virulence, and true that a severe epidemic of the disease did attack Salisbury City after the disease had shown itself upon the Plain. This epidemic was not more severe than that of Belfast some few years ago.

Passing to the question of the incubation period, the report emphasizes the saprophytic character of the meningococcus in the pharynx, in only a small proportion of the cases proceeding to secondary invasion of the body to constitute an attack of cerebro-spinal fever. Hence the difficulty of estimating the incubation period. In a few cases it has been possible to be certain. It may be as short as three or four days.

The most important general conclusion as regards epidemiology is the hypothesis, from the data given, of a "saprophytic epidemic" of the meningococcus in the throats of the population at large prevailing especially in winter and early spring, and giving rise under certain conditions to outbreaks of cerebro-spinal fever, which is thus, in the words of the report, "an epiphenomenon of the (saprophytic) epidemic." The section on treatment is very brief and rather iconoclastic. The reporters' experience with anti-meningococcal sera from four different sources (Flexner's, Mulford's, Burroughs Wellcome & Co.'s, and the Lister Institute's) has not been brilliant. The question might be asked if some of these sera have not deteriorated since they have become commercialized.

The early experience with Flexner's serum in this country

seemed to justify the very high praise accorded it. And in this connexion it might be mentioned that recent reports of the use of the serum prepared by the Ontario Board of Health have been very favourable. No other form of treatment seemed to do any good, save repeated spinal punctures, and in two cases the intraspinal injection of serum from a patient who had recovered from an acute attack. The committee holds that "until the type of coccus in individual cases is determined, and the homologous serum employed, it may justly be said that the serum treatment of cerebrospinal fever has not had its fairest chance."

SOLDIER'S HEART AND THE HAMPSTEAD HOSPITAL

A LEADING article in a recent issue of the *London Times*, as well as several communications in current British medical periodicals, draw the attention of the public to the important fact that the large number of soldiers invalided home by the now well recognized functional disturbance known as Soldier's Heart, in which symptoms of a more or less transient cardiac exhaustion form the predominant feature, has led to the opening of an investigation, and to the organization of a military heart hospital at Hampstead, London, designed especially for the study and treatment of such cases. The investigation was opened by the Medical Research Committee of the National Insurance Act, on the initiative of Sir Alfred Keogh, and was entrusted in the first place to Sir James Mackenzie,* who with Dr. R. McD. Wilson* opened a discussion on this subject before the Royal Society of Medicine on January 18th last, and reported the results of observations made by himself in collaboration with Dr. Wilson on four hundred cases. He pointed out that the large class of patients under consideration differ essentially from the subjects of organic heart disease both in the milder grade of symptoms, the more

* *Brit. Med Journ.*, January 22nd, 1916.

favourable prognosis and the form of treatment indicated. In the latter connexion he laid down the important principle that complete rest was not advisable except in the early stages, and that fresh air, graduated exercises, recreation and cheerfulness take an important part in the rehabilitation of the patient, so that officers should be sent off on golfing or fishing tours, and light games in out-door surroundings should be provided for the private soldiers, with the one injunction to both that such occupations be carried on only to the point of pleasurable enjoyment and never to fatigue. In addition he stated that the proper investigation and treatment of such cases required the provision of a special hospital with complete equipment and in suitable surroundings.

These views were shared by Sir Clifford Allbutt and Sir William Osler, who, with Sir James Mackenzie, have organized the new hospital, and with Major J. C. Meakins and Captain F. C. Cotton are among the members of its staff. The article in the *Times* reads: "Sir Alfred Keogh (Director General of Medical Forces), decided to open a special hospital of a very special kind, and recognizing the value of a bright and bracing situation chose the Military Hospital at Hampstead for the new Heart Hospital. How carefully the staff was selected may be seen by a glance at the list of names. The new hospital is not more fortunate in its staff that it is in its commanding officer, Colonel More Reid, who brings a wide knowledge and a broad sympathy to bear upon its many problems." The new hospital is fully equipped with bacteriological laboratory, electrocardiograph with wired connexions to the wards, orthodiagraph, and *x*-ray instalment. The Mackenzie ink polygraph is in active operation and individual assistants are giving their whole time to the study of vasomotor reflexes, dermographic and precise orthodiagraphic cardiac tracings, exercises, gas analysis, and other phases of the many problems investigated. Here the scientist and clinician are united, and the mental factor, which means so much, especially in this type of case,

is given due prominence. As in all army hospitals military considerations, of course, take the first place in the handling of the patients, the cases being as far as possible classified on arrival into those who will be again fit for active service and those who will not. In subsequent treatment the latter class are boarded out of the army, while in the former the myocardium is re-educated by graduated exercises to a point where the definite amount of exertion, such as half an hour's strenuous Swedish drill, or a seven mile route march with a twenty-five pound pack, can be undergone without symptoms. When this point is reached the men are considered fit to return to their unit.

The importance of this new hospital, which is in a sense a departure, can hardly be overrated. By accelerating the return to duty or invaliding from the service of the disabled soldier it will mean a saving to the State, and it constitutes one of the most interesting examples we know of the remarkable organization that has taken place in this war of preventive and therapeutic forces for the mitigation of the effects upon our soldiers of the terrible conditions of modern warfare.

The recent policy of the War Department in establishing these special hospitals, such as are illustrated by the one under discussion, and by the Eye Hospital at Bramshott with which Lt.-Col. Hanford McKee is associated, is to be especially welcomed, for only in this way can the powers of the many trained specialists who have placed their services at the disposal of their country by utilized, and it is obviously a waste of efficiency (though sometimes a necessity) to place such men in the field. Moreover, the establishment of this particular form of special hospital in England, which may be called the home of graphic methods, under the administration of a staff, whose chiefs are themselves the leaders of thought in the new school of cardiac pathology, with the control of a wealth of clinical material consisting chiefly of soldiers suffering from functional disorders of the cardiac mechanism, opens an extraordinary productive field of study

which is bound to bring far-reaching advances in our knowledge of cardiac pathological physiology on the one hand, and its therapeusis on the other. It is a matter of congratulation to us that two members of the staff are Canadians. Major J. C. Meakins, of the Royal Victoria Hospital, Montreal, was transferred to the staff from No. 3 Canadian General Hospital (McGill), in February, 1916, at the time of the organization of the Hampstead Hospital, and Captain T. C. Cotton, of the Montreal General Hosiptal, was appointed to Sir James Mackenzie's staff early last autumn. Both are men with faculties made expert by previous training in the Mackenzie-Lewis School, and whose names are associated with the publication of some of its previous researches,* who are competent to bring back to Canada the fruits of the observations made.

The history of this subject is of interest. The "irritable heart of the soldier" is no new condition, but was recognized as far back as the American Civil War, when it attracted wide attention. A classical description, corresponding in all respects to the picture as presented to-day is given by Dr. Hathorn in the *American Journal of Medical Sciences* for 1864, and in the same journal for 1871, Da Costa reviewed the subject upon the basis of a series of three hundred cases collected in a hospital in Philadelphia. The condition is characterized by signs of vasomotor instability, aching precordial pain, a sense of exhaustion amounting often to giddiness or faintness, general malaise, rapid pulse on exertion, slight breathlessness, at times slight œdema of the feet, mental depression, and nervous irritability. There is usually a slight rise of temperature especially at the onset, which is often with diarrhœa and other digestive disturbances. It is to be understood that only the most serious cases of cardiac instability are sent to England. Mild cases are looked after in France.

An interesting discussion upon the etiology of soldier's heart has occupied several of the British journals during the

* *Heart*, vol. v.

past six months. Sir James Mackenzie with W. Bezley Thorne,* R. McD. Wilson, and others, regard it as one symptom of a general physical exhaustion, the result in the majority of the cases of a latent infection which becomes active under the effect of strain or shock and produces the general effects of a toxæmia, which yields to the raising of the resistive powers of the individual by good hygiene, fresh air, and cheerful occupation. This view is supported by the experience at the hospital since its organization where the accumulation of facts is tending to show that the so-called soldier's heart results in nearly 80 per cent. of the cases from infectious disease, of which rheumatic fever holds the leading place. But it is rendered doubtful by the experience of Dr. R. D. Rudolf, of Toronto, who writes us that in the Medical Division of No. 2 Canadian General Hospital in France, of which he was in charge, every well marked case of cardiac instability was tested for the presence of streptococci with a negative result in every case.

The application of this theory of latent infection to all the cases is further disputed by Poynton,† Morison,‡ and others. They point out that identical symptoms come on quite suddenly after shell shock and other states in which the predominant feature is nervous or physical strain, and the question has been raised as to whether, under these circumstances, the shock itself may not generate toxins within the body producing a similar result upon the tissues as those having a true infective origin. Others point out that chemical poisons, as nicotine, produce the practically identical condition of tobacco heart, and believe that this is undoubtedly the cause in a large percentage of the cases. Finally, it has been shown (White and Johnston, § Stoney ‖), that some cases of soldier's heart present the early stages of exophthalmic goitre, what may be called a pre-Graves condition of hyper-

* *Practitioner*, May, 1916.
† *Brit. Med. Jour.*, November 20th, 1915.
‡ *Brit. Med. Journ.*, January 29th, 1916.
§ *Lancet*, January 8th, 1916.
‖ *Lancet*, April 8th, 1916.

thyroidism, and which yields to *x*-ray treatment of the thyroid gland. When it is remembered that shock or emotion of any kind is a strong predisposing cause of goitre this forms a comparatively small but suggestive group.

From many sides the further suggestion has come that all such etiological factors as the above mentioned act similarly within the organism, producing analogous states of cardiac and physical exhaustion. This theory has been advanced, quite independently of the British writers, by Crile in a most interesting form in his book on "A Mechanistic View of War and Peace," and in his article on "The Kinetic Drive,"* in which he suggests that all such etiological factors, latent infection, powerful emotion, physical strain, exaggerated hormonic action, may be considered in the light of activators which "set the pace" for an undue transformation of energy leading to alterations in the relation of the volatile and nonvolatile acids of the blood and other disturbances of the metabolic equilibrium with the consequent histologic and chemical changes that constitute fatigue.

It is too early for conclusions or even for surmises upon the outcome of these and the many other problems involved, but it is easy to see that the profession is likely to owe an incalculable debt of gratitude to the originators of the Hampstead Hospital, Sir Alfred Keogh, Sir James Mackenzie, Sir Clifford Allbutt, and Sir William Osler.

A QUESTION of particular interest to the country practitioner was debated before the Railway Commission on May 17th. Complaints have been made by several medical men that the railway companies have refused to stop freight trains when no passenger trains were available on which a doctor might travel who was going to an urgent case of accident or illness. The Commissioners were of opinion that such trains should be stopped when required, but no definite decision was arrived at since all the railways were not represented.

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* *Journ. Amer. Med. Assoc.*, December 18th, 1915.

THE Faculty of the New York College of Physicians and Surgeons recently expressed itself as unanimously in favour of the establishment of a dental department. The plans were prepared by a committee of prominent dentists and were duly approved. The new school will be closely associated with the medical school and the requirements for admission will be the same. A four year course will be given. The first two years will be the same as in medicine, thus giving the dental student a thorough knowledge of the fundamental sciences; the rest of the course will be devoted to the study of operative dentistry, prosthetic dentistry, oral surgery and pathology, orthodontia, and the more technical part of the work of a dental surgeon.

A MEDICAL MISSION was recently appointed by the United States authorities to study war conditions in Europe. Its members—Colonel Bradley, Major Lyster, and Major Ford, of the United States army, and Surgeon Pleadwell, of the United States navy—were entertained to dinner at the Athenæum Club, London, on May 24th by Director-General Sir Alfred Keogh and Sir William Osler. Among those present were the American Ambassador, and a number of officers of the Royal Army Medical Corps, the Canadian Army Medical Corps, and the Medical Service of the Royal Navy. It is the intention of the members of the mission to make an inspection of the system of dealing with the sick and wounded in England and a study of the hospitals and other medical arrangements in France.

THE Canadian Hospital at Dinard was formally opened by President Poincaré on April 15th, last. This hospital, No. 4. Canadian Stationary Hospital, was presented to France by the Canadian Government and has been receiving patients now for more than a year. The unit was recruited in Montreal and is under the command of Lieutenant-Colonel Mignault, of Montreal. President Poincaré was accompanied by Gen-

eral Depages, aide-de-camp; M. Justin Godart, director of the French Service de Santé; M. Hanotaux, of the Académie Française; the President of the Société France-Amerique, and others. Sir George and Lady Perley, and Surgeon-General Carleton Jones, C.M.G., director of the Canadian Medical Services, and the Honourable Philippe Roy, Canadian Commissioner in Paris, were also present. The President inspected everything with much interest; he enquired about the nature of the wounds sustained by each of the one hundred and fifty-five patients then in the hospital, and spoke a few words of encouragement to each man, presenting some with the Croix de Guerre or the Médaille Militaire. The wooden huts that have been built for those who are very badly wounded bear Canadian names, such as Quebec, Halifax, Three Rivers, Argenteuil, and over the portal of the latter the names Wolfe and Montcalm are inscribed. The total number of beds in the hospital is now five hundred, but it is probable that the Laval unit, No. 9 Canadian General Hospital, which is now in England under the command of Colonel Beauchamp, of Montreal, will be sent to Dinard.

Montreal has long enjoyed the unenviable reputation of having one of the highest infant mortality rates in the world. Some improvement has been made by the establishment of milk stations in the poorer districts of the city, and in 1914 the death rate amongst infants of not more than one year of age was 17·95 compared with 21·52 per thousand in the previous year; the figures for 1915 have not yet been published. The great difficulty, however, has been that much of the milk supplied in Montreal has been below the standard established by the municipal regulations and, moreover, has been extremely dirty. The milk dealers have sheltered themselves behind the contention that the city bylaws were invalid and that the matter rested with the Federal government alone. This meant that each conviction would have to

go before the Federal courts and the milk would have to be examined by an analyst employed by the Dominion government, at a cost of from $2.50 to $5.00 for each analysis. The expense incurred by such a procedure has been prohibitive and, consequently, the health authorities have been powerless to do anything to improve the situation. The important judgement given by Mr. Justice Greenshields, however, in the case of Savaria vs. the city of Montreal, establishes the validity of the milk-bylaws. Savaria was convicted last November and sentenced to a fine for having in his possession, with intent to sell in the city of Montreal, milk below the standard established by the civic bylaws. An appeal was entered and the case was taken before the Superior Court. In rendering judgement His Lordship declared that, in 1851, when the Charter of Montreal was consolidated, the city council was empowered to enact bylaws "for the good rule, peace, welfare, improvement, cleanliness, health, internal economy, and local government of the city." The British North America Act did not interfere with legislation already passed by the various provinces coming into Confederation, and later the Quebec legislature extended the powers of the city council of Montreal with regard to the regulation of milk.

THE following is taken from a recent issue of the *British Medical Journal:* "A Congress was held in Berlin early in February to discuss the care and education of crippled soldiers. An exhibition of artificial limbs and other devices for helping cripples to become self-supporting was also held. It was stated that in Austria this problem had been dealt with so drastically that it was impossible for a cripple to refuse treatment, and that in Hungary a special commission had been appointed, with powers to refuse pensions and every other compensation to cripples who would not be treated. Another speaker gave an account of the numerous institutions which had sprung up in connexion with the education of

cripples. He described how "compensation psychoses" were discouraged, and how the paramount importance of regaining their capacity for work was impressed on soldiers early, the healing of their wounds being treated as a secondary consideration. At the outbreak of the war there was hardly a single institution in Austria for the treatment and education of cripples. The initiative, ingenuity, and capacity for organization shown by Spitzy had done much to promote the welfare of the crippled soldier. His hospital contained 3,500 beds, 1,300 of which were devoted to soldiers with amputated limbs. The hospital included twelve different departments; one ward was set apart for wounds of the knee, another for wounds of the finger and so on. About three fifths of all the crippled Austrian soldiers had previously worked on the land, and new occupations on the land were chosen for them. Professor Dollinger said that in Hungary about 5,000 beds had been set apart for crippled soldiers, and institutions had been organized for the education of cripples, usually with a view to farm work. Dealing with the problems of artificial limbs, one speaker insisted that success depended much more on the cripple's desire to work than on the nature of the artificial limb. The standardization of every artificial limb was also insisted upon in order that the whole or part of such a limb could easily be replaced. It was also generally agreed that crutches should be dispensed with as early as possible and the cripple be given some temporary artificial limb, be its construction ever so primitive. In this connexion the plaster-of-Paris limb was warmly recommended."

Miscellany

Book Reviews

OBSTETRICS: A PRACTICAL HANDBOOK FOR STUDENTS AND PRACTITIONERS. By EDWIN BRADFORD GRAGIN, A.B., A.M. (Hon.), M.D., F.A.C.S., professor of obstetrics and gynæcology, College of Physicians and Suregons, Columbia University, New York; assisted by GEORGE H. RYDER, A.B., M.D., instructor in gynæcology, College of Physicians and Surgeons, Columbia University, New York. Illustrated with 499 engravings and 13 plates; 835 pages. Lea & Febiger, Philadelphia and New York, 1916. Price, $6.00 net.

In his preface to this work Dr. Gragin states that for some years he has felt the growing sense of a duty to place before the profession and students of medicine the methods followed in the Sloan Hospital of New York City, and the results obtained.

A protracted service as medical head of that institution, and many years of experience gained in a large private practice, qualify this author in an exceptional manner to fulfil the obligation.

Naturally from the association of the authors with the Sloan Hospital, this text-book of obstetrics, in the methods advocated, is based upon the extensive and carefully recorded statistics of that institution. Thus it constitutes a most valuable contribution to American statistics in obstetrics.

The arrangement of the subject matter is in general that conventionally followed, the only exception being that multiple pregnancy is included in Part II, under physiological pregnancy; the reason given being that as a rule multiple pregnancy is physiological and the labour not abnormal. While this may be granted, exception may be taken to the authors having included under the same heading dystocia consequent upon multiple pregnancy "in order to avoid a division of the subject of multiple pregnancy, and a separation of the parts by many intervening chapters."

In the section on mechanism, there seems to be some un-

necessary repetition and at times lengthy reference is made to the management which might be better taken up in the succeeding chapter which is devoted to the management of labour.

In the description of the mechanism of flexion of the head on page 259, the following statement is made: "Full flexion of the head does not occur until the head is on the pelvic floor, for usually there is no resistance until this is reached." The inference then is that the pelvic floor contributes to flexion of the head. Surely it has long been established that unless flexion is well established *before the pelvic floor is reached,* in vertex presentations, the course of labour becomes abnormal.

In the section dealing with toxemia of pregnancy it is stated that in the experience of the author the cases of pernicious vomiting have shown, as a rule, a high ammonia nitrogen, and a low urea nitrogen, and as the patient has become worse the percentage of ammonia nitrogen has increased and that of urea nitrogen decreased. Furthermore, as the patient improved the opposite condition has prevailed.

Is not this what would be found in the urine of any starving pregnant woman, may well be asked, especially as later on the author admits "that occasionally a careful study of the clinical picture of the patient will show an improvement before the laboratory findings?"

One notes that in the treatment of threatened eclampsia that veratrum veride and nitro glycerine are recommended in perference to venesection to reduce the blood pressure. Chloral in full doses is commended to control restlessness. For the last ten years the rule at Sloan has been that "given an eclamptic seizure, or a toxemia so severe as strongly to threaten eclampsia in spite of treatment, proceed to empty the uterus." To show that chloroform may contribute to accentuate the injuries caused by pregnancy toxemia, when employed as an anæsthetic, the authors give the following statistics: "In twenty thousand deliveries in which chloroform was used in all cases, there were two hundred and fifty-one cases of eclampsia; in eight thousand deliveries in which ether was used in all toxemic cases there were only seventy-one cases of eclampsia."

The authors state that the attempt to employ ether in all cases of labour at Sloan was followed with such unsatisfactory results they were obliged to return to the use of choloroform in all cases where evidences of a toxemia were absent.

The chapters dealing with abortion and ectopic gestation are to be specially commended.

Premature rupture of the membranes besides being responsible for an increase in the fœtal mortality in labour, contributed, especially in those cases in which the pains failed to come on for several days subsequently, to a definite increase in the maternal morbidity in the puerperal period. For these reasons the authors recommend that in all cases where uterine contractions have not been effective in starting dilatation of the os uteri in twenty-four hours after the rupture of the amniotic sac has taken place, resort should be had to the hydrostatic bag.

The book is interesting throughout and is at once a credit to the distinguished author and his assistant, and to American obstetrical literature. The style is clear and practical, and as a guide to the practitioner in obstetrics no better work has been published in the English language.

This text-book is specially to be commended to the undergraduate because of its characteristic simplicity, directness, and sane common sense.

The illustrations, most of them original, are extemely well selected and wisely employed, with the possible exception of the repetition of those on pages 178 and 254.

The publishers work has been excellently accomplished, and the result is a book of a size easy to handle and delightful to read.

Infant Feeding and Applied Topics for Physicians and Students. By Harry Lowenburg, A.M., M.D., assistant professor of pediatrics, Medico-Chirurgical College of Philadelphia. Illustrated with 64 text engravings and 30 original full-page plates, 11 of which are in colours. Philadelphia: F. A. Davis Company, publishers. 1916. Price, $3.00, net.

In this work along with chapters on infant feeding, there are included several dealing with rickets, scurvy, vomiting, diarrhœa, constipation, spasmophilia, exudative diathesis, and pyloric obstruction.

The author has been strongly influenced by the German school of pediatrics and the book is founded on his personal experience; it is therefore practical in character. The dilution of whole, or of skimmed, milk is advocated as a simple and efficient method of feeding infants, and individualization is insisted upon as a basic principle. The caloric system is discussed and its advantages and disadvantages pointed out.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

The Practical Medicine Series: Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Edited by Charles L. Mix, A.M., M.D., professor of physical diagnosis in the Northwestern University Medical School. Vol. I, General Medicine, edited by Frank Billings, M.S., M.D., head of the medical department and dean of the faculty of Rush Medical College, Chicago. Series 1916. Publishers: The Year Book Publishers, 327 S. LaSalle Street, Chicago. Price, $1.50. Price of the series of ten volumes, $10.00.

Diseases of the Nose and Throat: Comprising Affections of the Trachea and Œsophagus. A text-book for students and practitioners. By Sir St. Clair Thomson, M.D., F.R.C.P., F.R.C.S., commander of the Order of Leopold of Belgium. Second edition, 858 pages with 22 plates and 337 figures in the text. Publishers: London, Cassell & Company; Toronto, McAinsh & Company, 1916. Price, $7.50.

The Sex Complex: A Study of the Relationships of the Internal Secretions to the Female Characteristics and Functions in Health and Disease. By W. Blair Bell, B.S., M.D., Lond., examiner in gynæcology and obstetrics to the University of Belfast. 233 pages. Publishers: Baillière, Tindal and Cox, 8 Henrietta Street, Covent Garden, London, 1916. Price, 12s. 6d. net.

Collected Papers on Analytical Psychology. By C. G. Jung, M.D., LL.D., formerly of the University of Zurich. Authorized translation edited by Dr. Constance E. Long, medical officer, Education Board. 392 pages. Publishers, Baillière, Tindall and Cox, 8 Henrietta Street, Covent Garden, London, 1916. Price, 12s. 6d. net.

Obituary

Dr. Herbert Smith, of Burin, Newfoundland, died May 22nd, after a brief illness. Dr. Smith, who was sixty-seven years of age, was born in Bermuda and was the son of the late Reverend Thomas Smith.

Dr. Howard F. Lyster, of Hull, Quebec, died May 19th, in the forty-fifth year of his age. Dr. Lyster was born in Montreal and graduated from McGill University in 1896. He first went into practice at Melbourne, Quebec, but soon removed to Hull. He was appointed coroner for Ottawa County in 1907, upon the retirement of Dr. C. E. Graham.

Dr. J. Edgar Jones, of Digby, Nova Scotia, died from heart failure May 18th, in the seventy-ninth year of his age. Dr. Jones was born in Pictou County and practised for some time at Westport, removing from there to Digby. He was elected mayor of Digby by acclamation for four terms and three years ago received the appointment of postmaster there.

Dr. W. J. Graham died at Springfield, New Brunswick, on May 18th. Dr. Graham was born in Birkenhead, England, and came to Canada about five years ago. He was engaged as surgeon on the Transcontinental Railway.

Captain Douglas Waterston, M.D., C.A.M.C., who was killed in action about May 22nd, was the son of Thomas Waterston, of Montreal, and grandson of Captain J. B. Waterston, who commanded British transports during the Crimean War and whose death occurred in Montreal on May 21st, the day before Dr. Waterston was killed. Captain Waterston left Montreal with the 9th Field Ambulance, C.E.F., and had been at the front only about six weeks. He graduated from McGill University two years ago and was then appointed house surgeon at the Montreal General Hospital. He joined the C.A.M.C. early in 1915 and was attached to the Montenegrin Camp at Three Rivers for a time. He was twenty-six years of age and was born at Belleville, Ontario.

Captain N. J. L. Yellowlees, M.D., C.A.M.C., of Toronto, was reported to have died on service in the casualty list published on May 11th. He is reported to have been drowned at Salonica while attempting to reach a wreck on horseback. The accident was witnessed by a party of nurses from the Toronto University Hospital (No. 4 Canadian General Hospital), the unit to which Captain Yellowlees was attached. Dr. Yellowlees was born in 1886 and graduated from the University of Toronto in 1909. He was in practice in Toronto.

Lieutenant-Colonel Arthur William Tanner, C.A.M.C., of Moosomin, Saskatchewan, died June 5th, of wounds received while advancing to a dressing station. Before going to the front, Lieutenant-Colonel Tanner was A.D.M.S. for military district No. 10, with headquarters at Winnipeg. He left Winnipeg shortly before Christmas last year in command of the 10th Field Ambulance. As a practitioner Lieutenant-Colonel Tanner was well known in Saskatchewan and had been in practice at Moosomin since 1902. He was a member of the town council for six years and mayor of Moosomin for two years. He was in the forty-second year of his age and leaves a widow and four young children.

News

MARITIME PROVINCES

A report on conditions existing at the Infectious Diseases Hospital was recently submitted to the Halifax Board of Health by Dr. N. E. McKay. The report stated that, in the opinion of Dr. McKay, the hospital was not fit for the purpose for which it was used and that the whole of the interior would have to be torn down and renewed and the hospital enlarged before it could be made even passably suitable; that the location was not convenient; and that it would be better to build a new hospital on modern lines in a more convenient place. The present superintendent of the hospital is a layman and there is no graduate nurse on the staff. Dr. McKay recommends that a capable and experienced graduate nurse be placed in charge of the hospital, since at present the hospital authorities cannot afford to engage a resident house physician. Reference was made also to the provision of food for patients and staff and it was suggested that this matter be attended to by the

hospital board and not left in the hands of the superintendent, who had received during the twelve months just ended $7,772.81 for food alone.

The thirty-third annual report of the Prince Edward Island Hospital was published at the beginning of last month. The financial statement for the year closed with a deficit of $163.98, the receipts amounting to $16,115.22 and the expenses to $16,279.20. The deficit last year was $263.26, so that the total deficit on current account amounts to $427.23. Outstanding accounts, however, amount to more than this. The number of patients who received treatment during the past year was 562, as compared with 417 during the previous year, and the days of treatment given during 1915-1916 were 12,926 compared with 8,563 during the previous year. The hospital now contains accommodation for about sixty patients.

The plans have been prepared for the new Fraser building to be added to the Victoria Public Hospital at Fredericton.

ONTARIO

The distinction of C.M.G. has been bestowed by His Majesty upon Dr. Frederick Montizambert, I.S.O., Director-General of Public Health of Canada.

The following is the list of communicable diseases reported in the Province of Ontario during the month of May: measles, 2,980 cases, 14 deaths; diphtheria, 170 cases, 7 deaths; scarlet fever, 120 cases, 7 deaths; whooping cough, 160 cases, 10 deaths; tuberculosis, 175 cases, 82 deaths; smallpox, 10 cases; infantile paralysis, 1 case; cerebrospinal meningitis, 7 cases, 4 deaths.

Major R. K. Kilborn has given up his position as medical officer at the Royal Military College, Kingston, on account of ill health. Dr. Kilborn has occupied this post for sixteen years.

The Lady Minto Hospital at Cochrane was formally opened on May 24th. At the time of the opening seven patients were already in the hospital.

Dr. Stanley has been appointed medical officer of health at

St. Mary's for the remainder of the year, in succession to Dr. Fraleigh who will leave shortly for service overseas.

The following is the list of candidates who have passed the spring examinations of the College of Physicians and Surgeons of Ontario: W. H. T. Baillie, of Toronto; J. E. Barry, of Toronto; N. W. Bragg, of Brantford; P. B. Brown, of Toronto; B. R. Burwash, of Baltimore, Ontario; G. M. Cameron, of Hamilton; D. Corcoran, of Toronto; P. W. M. Curry, of Trenton, Ontario; L. W. Dales, of Drayton, Ontario; G. A. Davis, of Toronto; J. A. Dickson, of Toronto; H. B. Freel, of Stouffville, Ontario; G. M. Geldert, of Ottawa; A. E. Gillies, of Port Hope; J. Z. Gillies, of Toronto; W. C. Givens, of Toronto; E. A. Goode, of New York; S. G. Graham, of Lobo, Ontario; A. C. Greenaway, of Woodville, Ontario; H. C. Hagyard, of Milton, Ontario; J. E. Hawkings, of London, Ontario; H. B. Hetherington, of St. Catharines; L. R. Hill, of Toronto; W. E. Hodgins, of Lucan, Ontario; A. B. Hyndman, of Merrickville, Ontario; A. B. Jackson, of Simcoe, Ontario; R. M. Janes, of Watford, Ontario; A. W. Knox, of Lougheed, Alberta; J. H. Leeds, of Galt; G. T. Lewis, of Windsor; A. R. Lindsay, of Toronto; N. H. Little, of Trenton, Ontario; D. McC. Livingstone, of Collingwood; W. A. Lowe, of Haileybury; A. J. MacCallum, of Owen Sound; A. R. MacDonald, of Jarvis, Ontario; W. MacK. MacKay, of Cornwall; J. A. MacMurchy, of Acton, Ontario; H. B. Maitland, of Toronto; D. C. Matheson, of Kingston; O. W. Mitton, of London, Ontario; A. McCallum, of Toronto; F. L. McCarroll, of Thornepayne, Ontario; J. E. McCorvie, of Chatham; W. P. McCowan, of Toronto; J. C. McCullough, of Walter's Falls, Ontario; J. L. McDonald, of Toronto; D. C. McFarlane, of Dorchester, Ontario; W. J. McLean, of Blind River, Ontario; G. D. McTaggart, of Hamilton; A. H. Naylor, of Lindsay, Ontario; A. C. Norwich, of Toronto; O. G. Patterson, of Toronto; E. E. Phoenix, of London, Ontario; H. O. Pope, of Bothwell, Ontario; G. W. Renton, of London, Ontario; R. B. Robson, of Petrolea; J. G. Ross, of London, Ontario; W. V. Sargent, of Kingston; P. A. Sarjeant, of Barrie; G. Scullard, of Chatham; J. H. Sharpe, of Toronto; E. E. Shouldice, of Calgary, Alberta; H. A. Simpkins, of Thamesville, Ontario; T. A. Sinclair, of Walkerton; R. J. Snider, of Toronto; S. S. Solway, of Fort Frances, Ontario; F. Spearing, of Batteau, Ontario; A. L. Speers, of Merton, Ontario; G. H. Stobie, of London, Ontario; B. C. Switzer, of Toronto; G. E. Tanner, of Sarnia; R. H. Taylor, of London, Ontario; F. F. Tisdall,

of Toronto; C. H. Warriner, of Toronto; C. J. McN. Willoughby, of Toronto; F. B. Gladstone Wilson, of Toronto; M. J. Wilson, of Toronto; A. M. Young, of Binbrooke, Ontario; D. R. Young, of Thamesford, Ontario; H. G. Young, of St. Mary's; and W. L. Yule, of Logansport, Indiana.

The following have been appointed house surgeons at the Victoria Hospital, London: Drs. Stanley Murray, A. McKay, D. D. Ferguson, L. M. Jones, and Renwick.

An inspection was recently made by Dr. Howitt, medical officer of health, of the pipe line through which Guelph receives its water supply. In a report submitted to the Board of Health, Dr. Howitt stated that the water supply is now in a worse condition than ever. In January, 1915, the provincial board of health drew attention to the contaminated condition of the water. Since then a new pipe has been installed up to a certain point where it connects with the old pipe which is of glazed tile and consequently permeable where the joints occur; the new pipe is of iron but has two six-inch diameter vent holes which permit the swamp water to flow into the pipe. In consequence of Dr. Howitt's report, the city engineer was instructed to make a thorough examination of the pipe line. This was done and a report submitted, whereupon the following resolution was passed by the board of health:

"That the reports of the Medical Officer of Health, the City Engineer and the Sanitary Inspector respecting the condition of the new water pipe line connecting the Carter and Stone springs with the city water-works be referred to the City Council, and that, whereas it is now over sixteen months since our water supply was found to be contaminated and over six months since the new supply has been added to the old, and as the new supply has been found to be badly contaminated, and to have been left unprotected, and to have been improperly constructed during all this time, thus showing that the Water Commissioners could not have taken trouble to familiarize themselves with the line, or that they have been dangerously negligent in their duties, we are of the opinion that the City Council should take such steps as it may deem expedient to have, in the shortest possible time, the water supply of Guelph well guarded and the line repaired or altered, even if this might necessitate the reorganization of the present Water Commission, or submitting a by-law to the electors that they might vote on the abolition of the Water Commission, and furthermore be it stated

that we take this step without prejudice to any one, but having only one idea in view, that is the safety of the water supply of Guelph and interest for the welfare of its citizens, this being our duty."

QUEBEC

THE annual report of the Alexandra Hospital, Montreal, shows that during the year 1915, 903 cases were treated including 417 of diphtheria, 292 of scarlatina, 180 of measles, 6 of erysipelas, and 3 of cerebrospinal meningitis. There were 54 deaths, i.e., a rate of 5 per cent. The cost of maintenance amounted to $2.20 a day for each patient. The nurses' home which was opened about eighteen months ago has improved conditions at the hospital, but pavilions for erysipelas and mixed infections are urgently needed.

DR. T. B. DAVIES has been appointed coroner for Hull in succession to the late Dr. H. F. Lyster.

MANITOBA

THE second annual meeting of the Dominion Women's Missionary Society of the Presbyterian Church was held in Winnipeg on June 6th and 7th. Reference was made in the presidential address to the need for more women medical missionaries and a resolution was passed that financial assistance be given to young women who are willing to enter the field of medical missions. The society maintains in this country nine hospitals, seven educational homes among the foreign communities, four educational homes in the Province of Quebec, seven boarding schools, and seven day schools among the Indians. Sixty-four missionaries are engaged in evangelistical, medical, and educational work in the foreign field.

ALBERTA

THE cottage hospital at Beverly, which was opened on May 10th, is said to be the first one in this country to be established and maintained by a municipality.

SASKATCHEWAN

THE epidemic of grippe which occurred practically all over the country during the months of January and February prepared the way for other infectious diseases such as measles and whooping cough. These have not been so prevalent in Saskatchewan as in

some other parts of the country. However, in Saskatoon during the month of April, 683 cases of infectious disease were reported, and among these were 653 cases of measles. In March, 273 cases of measles were reported amongst a total of 295 cases of infectious disease.

THE annual meeting of the Saskatchewan Medical Association will take place at Regina from July 18th to 20th, inclusive.

BRITISH COLUMBIA

DR. H. E. YOUNG, of Victoria, who for many years was provincial secretary and minister of education, has been appointed secretary of the health department and provincial health officer.

CERTAIN reflexions on the condition of the tubercular ward of the Royal Jubilee Hospital at Victoria were recently made by the Grand Jury of the Assize Court. It appears that there was some ground for the statements but that the hospital authorities are not to blame in the matter. When the law requiring hospitals in receipt of governmental grants to provide accommodation for patients suffering from tuberculosis came into force, the hospital authorities asked for a grant from the city council to meet the demands of this law; their request, however, was refused and as no funds were available for the purpose they did the best they could under the circumstances, that is they put up a number of small sheds which serve as a tubercular ward but which do not offer adequate accommodation for the number of patients. A special committee was appointed some time ago to approach the provincial government in the matter. The Premier and other members of the administration were interviewed but the application has not yet come up for consideration by the executive. At a recent meeting of the Board of Directors of the hospital, it was decided that the request for a governmental grant of $10,000 should be repeated at once. A maternity ward has been added recently to the hospital and was formally opened on May 26th; the furnishings were supplied by the Women's Auxiliary.

DR. G. T. WILSON has been appointed medical officer of health and city bacteriologist at New Westminster in succession to Dr. A. L. McQuarrie, who has gone overseas with the 121st Battalion. Dr. R. E. Walker has been appointed coroner.

The annual meeting of the Board of Directors of the King's Daughters' Hospital at Duncan was held May 4th. During the year ending March 31st, 1916, 136 patients were treated, the number of hospital days was 2,634 as compared with 3,059 during the previous year, and the average cost of maintenance was $2.66 a day for each patient.

Judgement was recently obtained by two physicians of Vancouver against the Pacific Lock Joint Company. Action was brought by the physicians to recover the amount of an account rendered for professional services given to an employee of the Company who had been brought to the office of one of the doctors by the superintendent, suffering from an injury to the eye. The superintendent stated that the Company would be responsible for the fees and a specialist was called in by the doctor. The Company denied liability on the ground that the superintendent had no authority to say that they would pay and that the doctor had no right to call in a specialist.

The recent amendment to the Hospital Act throws the onus of responsibility for hospital expenses incurred by its residents upon the municipality. In the past the municipality has been responsible only for "indigent" patients, but as it is extremely difficult to prove that a patient is indigent, the hospitals have frequently been unable to collect the fees either from the patient or from the municipality. By the new arrangement, should his bill not be paid by the patient, the municipality will pay the hospital and will then endeavour to collect the amount from the patient.

Dr. G. S. Graham, formerly pathologist and bacteriologist at the City Hospital, Boston, has been appointed chief of the Vancouver General Hospital Laboratories.

MEDICAL COLLEGES

McGill University

At the conference of representatives of Canadian universities held at McGill University in May, it was recommended by the medical committee that the course in medicine should be extended from four to six years as a minimum.

THE annual convocation for conferring degrees in medicine and agriculture took place on Thursday, May 18th, when the degree of M.D., C.M., was conferred on the following successful candidates, twenty-eight in number: John Ernest Affleck, Glasgow Station, Ontario; Charles Magee Anderson, Ottawa; Sidney George Baldwin, Vancouver; Harry Alfred Barrett, Durieu P.O., British Columbia; Peter Smyth Campbell, B.A., Port Hood, Nova Scotia; Kelcey Ireland Conover, Montreal; Ernest Couture, Hull, Quebec; Harry Goldblatt, B.A., Montreal; Alton Goldbloom, B.A., Vancouver; Esau A. Greespon, Hawkesbury, Ontario; Louis Gross, Montreal; Louis John Hartman, Alexandria Bay, New York; Abraham Theodore Jacob's, Montreal; Burton Oreno Kinney, Florenceville, New Brunswick; Joseph Leavitt, B.A., Montreal; Thomas Francis McCaffery, Montreal; Herbert Bruce McEwen, New Westminster; John James MacPherson, Port Daniel West, Quebec; Charles Augustus Marlatt, Waterford, Ontario; McColl Metcalfe, Vankleek Hill, Ontario; Charles Alfred Molleur, Montreal; Robert Oliver, New Westminster; John Alfred O'Regan, St. John, New Brunswick; Harold Francis Owens, Bridgeport, Connecticut; Frank D. Learn Phelps, Westmount, Quebec; Gordon William Roberts, Ottawa,; Louis Arthur Smith Stewart, Alymer East, Quebec; Willis Edmund Sullivan, Biddeford, Mobile.

The *ad eundem* degree of M.D., C.M., was conferred *in absentia* upon Mrs. Mary Adelaide Runnells Bird, M.D., a graduate of Bishop's College. Mrs. Bird is engaged at present in hospital work in England and, with the exception of Dr. Maude Abbott, curator of the McGill Pathological Museum, is the only woman thus honoured by the University of McGill.

The award of medals and prizes in the graduating class was as follows: Holmes Gold Medal for the highest aggregate in all subjects forming the medical curriculum, Louis Gross, Montreal.

Final prize for highest aggregate in fifth year subiects, Harry Goldblatt, B.A., Montreal.

Wood Gold Medal for the best examination in all the clinical branches, H. B. McEwen, New Westminster.

McGill Medical Society's Senior Prizes, 1st, H. Goldblatt, B.A., Montreal; 2nd, Alton Goldbloom, Vanvouver.

University of Toronto

THE following were granted the degree of M.B. at the annual convocation which took place in May last. It has been decided by the university authorities that, during the war, no medals,

honours, or scholarships shall be awarded. Consequently, the names are in alphabetical order without regard to merit:

Gordon Wilson Armstrong, B.A.; James Everett Barry, Charles Noble Black, William Albert Blake, Arthur McAmmond Blakely, Norman Walter Bragg, Percival Beckett Brown, B.A.; George Milne Cameron, B.A.; Eric Kent Clarke, Isaac Cohen, Willis Clarence Connell, Duncan Corcoran, Miss Lillias Waugh Cringan, Percy William Mark Curry, Lowell Windass Dales, B.A.; George Albert Davis, B.A.; James Archibald Dickson, B.A.; Hammet Alonzo Dixon, Thomas Lorne Dobson, Charles Phillip Fenwick, Victor Percy Fleming, Walter Samuel Foote, Herbert Barnes Freel, Albert Earl Gillies, William Clarke Givens, Stanley Galbraith Graham, Aubrey Vernon Greaves, Alfred Clayton Greenaway, Henry Arthur Hessian, Harry Brown Hetherington, Lawrence Roland Hill, Wilfred Ernest Hodgins, Arthur Isaacson, Alan Bart Jackson, Robert Merredith Janes, William Ewart Jones, Arthur Wesley Knox, Aleck Donald Lapp, Charles Terrell Lewis, George Franklin Lewis, Arlof Robert Lindsay, Neville Hall Little, William Arthur Lowe, Hugh Bethune Maitland, Archie McCallum, Arthur Jeffers MacCallum, William Porteous McCowan, B.A.; John Clark McCullough, Alexander Edward MacDonald, Ashley Roy MacDonald, John Laing McDonald, Charles MacKay, William John McLean, Donald Stirling MacLennan, B.A.; Virgil Paul MacMahon, John Archibald MacMurchy, Allen Young McNair, Ewart Earl McPherson, Russell Galbraith MacRobert, Arthur Herbert Naylor, Arthur Caven Norwich, Miss Olive Gair Patterson, M.A.; Russell Beattie Robson, Wilfrid Burke Rutherford, Percy Albert Sarjeant, Charles Isaac Scott, Garner Scullard, James Harold Sharpe, Edward Earl Shouldice, Thomas Alexander Sinclair, M.A.; Frederick Spearing, B.A.; Austin Laverne Speers, James Arthur Stanley, George Herbert Stobie, Bertrand Carlisle Switzer, Roy James Snider, Garnet Edward Tanner, Frederick Fitzgerald Tisdall, Charles Herbert Warriner, B.A.; Percival Algernon Williams, Charles James McNeil Willoughby, Frederick B. Gladstone Wilson, Malcolm James Wilson, B.A.; Miss Agnes Merle Young, Harvey Gordon Young.

An interesting feature of the Convocation was the conference *in absentia* of the degree of LL.D. upon Lieutenant-Colonel George G. Nasmith, C.M.G., in recognition of his distinguished services in France and Flanders during the present war. Lieutenant-Colonel Nasmith, at the beginning of the war, was appointed analyst

and advisory officer on sanitation for the Canadian forces. He accompanied the first Canadian contingent to the front and there soon distinguished himself by his splendid work in connexion with sanitation and the water supply. Later he discovered a means of counteracting the effects of the chlorine gas employed by the enemy. His services have been recognized already by His Majesty who, some months ago, appointed him a Companion of the Order of St. Michael and St. George.

Queen's University

Dr. S. M. Asselstine has been appointed to the Chair of Pharmacology and Therapeutics in the University. Dr. Asselstine has been lecturer in these subjects for the past two years.

Queen's Military Hospital (No. 7 Canadian General) is now stationed at Le Tréport, France.

Western University

At the recent convocation the honorary degree of LL.D. was conferred by the University upon Drs. H. A. MacCallum, Walter H. Moorhouse, and F. R. Eccles, of London, Ontario, and upon Dr. Leonard G. Rowntree, professor of medicine in the University of Minnesota.

The Western University Military Hospital (No. 10 Stationary Hospital, C.E.F.) is now up to full strength. Its officers, whose names are given on another page of this issue, are all graduates of Western University, and among the rank and file are also many graduates of the University—business and professional men who have given up everything to go to the front. Captain Brock, the quartermaster, is well known in the athletic world and has been lecturer in English and History at the University for some time. The Commandant, Lieutenant-Colonel Edwin Seaborn, M.D., is associate professor of clinical surgery and lecturer in Surgery at the University.

The following is the list of successful candidates who received the degree in medicine at the close of the 1915-16 session: Roy John Farmer, John Edgar Hawkins, Arthur John Ireland, Wesley Nesbitt McCormick, Donald Cecil McFarlane, Wilbery Orland Mitton, Edward Emanuel Phoenix, Harry Overton Pope, George Wellington Renton, James Gordon Ross, Harold Algernon Simpkins,

Daniel Logan Stewart, Robert Hobbs Taylor, Wilfred White, Harvey John Wildfang, Donald Roy Young.

ARMY MEDICAL SERVICES

THE following honours were awarded by His Majesty the King on the occasion of his birthday to members of the Canadian Army Medical Corps and Canadians serving in the Royal Army Medical Corps.

C.M.G. Lieutenant-Colonel J. T. Fotheringham, Commanding Officer of No. 4 Canadian General Hospital (Toronto University).

Military Cross. Captain G. E. Kidd, C.A.M.C. Temporary Lieutenants J. S. McCallum, R.A.M.C., and C. T. Galbraith, R.A.M.C. Temporary Lieutenant William John Knight, R.A.M.C., of Guelph, Ontario, attached to the 73rd Field Ambulance, B.E.F., "for conspicuous gallantry and devotion to duty when in charge of an advanced dressing station under heavy shell fire. He continued to attend the wounded with great coolness."

Royal Red Cross Decoration. First Class—Matrons M. O. Boulter (Assistant Matron-in-Chief), E. M. Charleson, A. C. Strong, B. J. Willoughby, and E. M. Wilson. Second Class—Nursing Sister S. M. Hoerner.

Promotion. To be Brevet-Colonel: Major (temporary Brigadier-General) A. C. Geddes, M.D., professor of anatomy, McGill University.

THE following members of the Canadian Army Medical Corps were mentioned for gallant and distinguished conduct in the field in the recent despatch from Sir Douglas Haig, Commander-in-chief of the British forces in France and Belgium: Brigadier-General Rennie, Lieutenant-Colonels Foster, Fotheringham, and Campbell, Majors Amyot, Rankin, and Snell; Captains Jeffs, Jenkins, and Hale; Sergeant-Majors Walsh, Keith, Buswell, Clarke, Jenner, and Nott; Quartermaster-Sergeant Rotsey; Acting-Sergeant Campbell; and Matron Strong, of the Nursing Service.

DR. N. M. KEITH, of Montreal, has joined the Harvard Medical Unit for service with the British forces.

HON. DR. BELAND, M.P., who was a prisoner in Germany for some months, has been released and is now in Holland.

Lieutenant-Colonel J. R. Spier, C.A.M.C., of Montreal, has been appointed chief of the medical section of No. 2 Canadian General Hospital, France. Lieutenant-Colonel Spier went to the front as medical officer of the 23rd Battalion. He was attached for some time to the staff of the Duchess of Connaught's Canadian Red Cross Hospital at Cliveden.

The Military Cross has been awarded to Captain John Arthur Cullum, C.A.M.C., regimental medical officer of the 28th Battalion. Captain Cullum has already been mentioned in despatches on more than one occasion for conspicuous bravery on the field of action.

The following is the honorary staff of the Daughters of the Empire Canadian Red Cross Hospital for Officers: physicians, Colonel Sir William Osler and Dr. J. Campbell McClure, of London; surgeons, Sir Alfred Pearce Gould, and Lieutenant-Colonel Donald Armour; laryngologist, Major Badgerow; dental surgeon, Captain Cameron Stewart; skin specialist, Dr. E. J. D. Mitchell; ophthalmic specialist, J. B. Lawford, Esq. Captain Creighton, C.A.M.C., is the resident medical officer.

The following is the list of officers of No. 4 Casualty Clearing Hospital which has been recruited in Winnipeg. Lieutenant-Colonel S. W. Prowse, commanding officer; Majors F. T. Cadham and W. W. Musgrove; Captains D. F. McIntyre, James Pullar, J. O. Todd, R. M. B. Mitchell, adjutant, and H. F. Harman, quartermaster; Lieutenant R. G. Young.

Major E. O. Steeves, of Moncton, New Brunswick, has been given command of the military hospital at Aldershot Camp, Nova Scotia. Dr. Steeves was formerly medical officer of the 145th Battalion.

Lieutenant-Colonel R. M. Simpson, of Winnipeg, has been appointed assistant director of medical supplies on the headquarters' staff at Camp Hughes.

Lieutenant-Colonel H. A. Chisholm, D.S.O., is now A.D.M.S. of the Fifth Canadian Division in England, with Captain J. S. Jenkins, of Charlottetown, as deputy.

The following is the list of officers of No. 10 Stationary Hospital, the gift of Western University: Lieutenant-Colonel Edwin Seaborn, Officer Commanding; Majors C. E. Brown, and J. C. Wilson; Captains J. S. Hudson, A. Turner, F. W. Luney, E. H. Young, J. Moriarty, C. L. Douglas, E. Bice, R. H. Henderson, and G. M. Brock, quartermaster; Lieutenant J. A. Dickie, dispenser. The personnel of the unit includes twenty-five non-commissioned officers, sixty ward privates, sixteen batmen, fourteen general men, one matron, ten nursing sisters, and sixteen staff nurses.

Major L. E. W. Irving, D.S.O., of Toronto, is in command of the Canadian division at the Woodcote Park Convalescent Hospital, near Epsom. This is the largest hospital of its kind in the United Kingdom and now has accommodation for about four thousand patients. The Canadian division consists of two sections—the Woodcote Park section with five hundred beds, which is in charge of Captain D. A. Murray, of Toronto; and the Farm Camp section with one thousand beds, in charge of Captain Goulden, of Winnipeg. Captain G. P. Howlett, of Ottawa, is the medical officer of the division.

Major George T. McKeough, C.A.M.C., of Toronto, has been appointed president of the Canadian Medical Board at Bramshott Camp, England.

Captain J. H. Conklin, C.A.M.C., of Winnipeg, has joined the First Field Ambulance Corps which is now in training at Camp Hughes.

Major W. E. Nelson, of Montreal, has been transferred to No. 2 General Hospital, and Captain W. O. Claxton to No. 7 General Hospital, C.E.F.

Captain C. J. McMillan, M.D., of Charlottetown, has been appointed second in command of the McGill Overseas Unit which is in training at Halifax.

Captain G. G. Corbet, C.A.M.C., of St. John, New Brunswick, is registrar at the Canadian Convalescent Hospital at Bearwood Park, Wokingham, England.

The following have been appointed medical officers of overseas

battalions: Captain Baldur H. Olson, assistant superintendent of Ninette Sanatorium, of the 223rd Battalion; Captain Parker, of Hamilton, of the 86th Machine Gun Battalion; Captain H. C. P. Hazlewood, of Toronto, of the 204th Battalion; Major W. A. McIntosh, of Simcoe, Ontario, of the 133rd Battalion; Captain T. W. Walker, of Saskatoon, of the 196th Battalion; Captain M. A. Oulton, of Shediac, New Brunswick, of the 145th Battalion; Captain Arthur M. Blakely, of Chatham, Ontario, of the 186th Battalion; Captain Elmer J. Dickenson, of Winnipeg, of the 119th Battalion.

Lieutenant-Colonel Harry Gordon, C.A.M.C., of Winnipeg, is in command of the 12th Field Ambulance, which was recruited in Winnipeg. Lieutenant-Colonel Gordon was formerly medical officer of the 61st Battalion.

The following lieutenants in the C.A.M.C. have been gazetted lieutenants in the R.A.M.C.: L. E. Bolster, W. G. Shaw, W. A. Cardwell.

Promotions in the C.A.M.C. To be Lieutenant-Colonel: Majors F. W. Wilson, H. A. Chisholm, D.S.O., E. G. Davis, E. J. Williams, J. McCombe and D. MacGillivray. To be Captain: Lieutenants S. G. Baldwin, J. E. Afleck, and H. B. MacEwen.

The following officers of the C.A.M.C. have been appointed temporary lieutenants in the R.A.M.C. Captain H. B. Maxwell, Lieutenants C. E. A. Trow, M.B., G. Stewart, M.B., L. W. B. Braine, M.D., T. W. F. MacKnight, M.D., E. C. A. Reynolds, M.D., R. A. MacKay, M.B., J. E. O'Donnell, M.D., D. L. MacKenna, M.B., H. G. Joyce, and G. F. Nelson, M.D.

CASUALTIES

Lost on H.M.S. Hampshire

Captain Harold Chaplin, of St. John's, Newfoundland. Dr. Chaplin was in the Newfoundland Naval Reserve and was surgeon on the *Hampshire* when that vessel met with disaster. His brother died of wounds last year.

Missing

Captain W. R. W. Haight, C.A.M.C.
Captain Frank Stewart Park, C.A.M.C., of Toronto.

Seriously Ill

Nursing Sister Gertrude Lilian Spanner, of Toronto.

Wounded

Captain John Aylmer Reid, C.A.M.C., of Pinkerton, Ontario.

Captain W. L. Shannon, C.A.M.C., of Vancouver, medical officer of 10th Cavalry Battalion.

Captain J. J. Jamieson, C.A.M.C.

Lieutenant E. V. Sullivan, R.A.M.C., of St. Stephen, New Brunswick.

Suffering from Shell Shock

Captain F. Perras, C.A.M.C., of Montreal, medical officer of 22nd Battalion.

Canadian Literature

Original Contributions

The Public Health Journal, May, 1916:

Social service and hospital efficiency	H. R. Y. Reid.
Feeble-minded and the public schools	C. G. Fraser.
The physician in industry	M. W. Alexander
Prevention of venereal disease	H. B. Weston.

L'Union Médicale du Canada, May, 1916:

Responsabilité médicale	W. Derome.
Comment guerir les bossus	R. Falardeau.

The Canadian Journal of Medicine and Surgery, May, 1916:

Open operation for fractures . . . W. E. Gallie.

La Clinique, May, 1916:

La réaction de Wassermann . . . H. Gringon.
La cure d'inanition du diabète sucré . G. Juilly.
Un cas de fièvre typhoide traité par l'electrargol . . . . . O. E. Desjardins.

The Canadian Journal of Medicine and Surgery, June, 1916:

Danger signals in anæsthesia. . . . S. Johnston.

The Canadian Practitioner and Review, June, 1916:

Pediculosis pubis . . . . . D. W. Montgomery.
The determination of sex . . . . . J. S. Freeborn.

Dominion Medical Monthly, June, 1916:

The periodic medical examination . . G. Elliott.

The Canada Lancet, June, 1916:

The history of medicine in Britain . . J. Ferguson.

Retrospect

SURGERY

THE OPERATIVE TREATMENT OF PYLORIC OBSTRUCTION IN INFANTS. By William A. Downes, New York. Surgery, *Gyn. and Obstet.*, March, 1916.

(A review of sixty-six personal cases)

ETIOLOGY

1. The presence at birth of a true malformation.
2. Œdema resulting from the efforts to force food through a narrow and elongated pyloric lumen.

Downes states that œdema was present in all of his sisty-six cases.

Symptoms

Of the clinical symptoms Downes lays most stress upon the presence of tumour. In his series tumour was noted before operation in all. Where necessary for diagnosis, the administration of a light anæsthetic and the passing of a tube into the stomach to remove gas is advised as a routine procedure. Downes considers the presence of tumour to the right and above the umbilicus as pathognomonic of the condition.

Operative Treatment

Of the two methods employed (a) posterior gastro-enterostomy and (b) partial pyloroplasty (Rammstedt operation), the latter has yielded the best results. The technique of the operation is as follows. An incision is made through the right rectus immediately over the tumour. The tumour should then be brought into the wound and held firmly between the thumb and index finger of the left hand. An incision 2-3 cm. in length is made over the mass from the duodenum to the stomach, and carried through the serosa and hypertrophied sphincter. As the incision is deepened, the edges of the wound beginning at the stomach end should be gradually forced apart. The danger of opening the bowel where the sudden change from the thickened and œdematous pylorus to the normal duodenum occurs should be avoided. When the muscle is sufficiently divided, and the edges separated, the mucosa protrudes freely into the wound. Such slight hæmorrhage as may occur is easily controlled by the application of hot pads. No attempt should be made to cover the incision in the pylorus. The operation should take from ten to twenty minutes.

Results

In 31 gastro-enterostomies there were 11 deaths; mortality 35 per cent. In 35 partial pyloroplasties, 8 deaths; mortality 23 per cent.

Conclusions

Downes concludes that partial pyloroplasty has the following advantages over gastro-enterostomy:

1. The operation requires less than half the time.
2. The reaction is more prompt.
3. Feeding is begun earlier and can be pushed more rapidly.
4. Post-operative vomiting is less.

5. Late complications, such as diarrhœa and unexplained vomiting, do not occur.

6. The operation is simple and requires less surgical skill.

7. Obstruction is permanently removed and normal continuity of the alimentary tract is preserved.

The objections raised against the method are: (1) that it leaves an uncovered wound; (2) that the abdominal cavity is protected from contamination only by a thin layer of mucous membrane; and (3) that, as the scar contracts, the obstruction will reform. Downes believes these criticisms to be largely theoretical —as shown by the excellent results obtained by the method. The real danger of the method is the opening of the mucous membrane, but this can be avoided with care.

A gastro-enterostomy should be added, if there is reason to suspect that the lumen of the pylorus is not patent after division of the circular muscle.

Until something better is proposed, Downes thinks the Rammstedt operation the operation of choice for pyloric obstruction in infants.

E. M. von Eberts

RADIOLOGY

IN the March number of the *Archives of Radiology and Electrotherapy*, pages 332-335, an interesting account of the organization of the *x*-ray department of a General Hospital in France is given by Captain A. H. Pirie, C.A.M.C., who is in charge of this department in No. 3 Canadian General Hospital (McGill).

The first step taken in connexion with the *x*-ray department was a visit to New York where arrangements were made as to the type of apparatus. Two apparatuses were ordered and were transferred to Ottawa, where they were unpacked, tested, and repacked. They arrived in France in good condition. Until the hospital was opened, the staff of the department was occupied by preliminary preparations. The quarters allotted were: *x*-ray room; developing room; engine room, and tent—a fluoroscopic room would have been an advantage.

The *x*-ray room was made light tight with blinds specially built for the purpose, so that the room could be quickly lightened

and darkened. An *x*-ray table was built from a standard table as used in the wards, with an *x*-ray proof tube box under the table. The wires carrying the current were placed in an underground tunnel, and led through the floor to the *x*-ray tube under the table, thus avoiding any chance of shock to the operator or spectators. This arrangement proved statisfactory in every way. An upright fluoroscope was also built and proved equally satisfactory. The tent was used for storing packing cases, of which there were about twenty; it was also used for drying the plates and demonstrating them in the Wheatstone stereoscope. The storing of the packing cases proved very useful as the hospital has since been moved to other quarters. Two *x*-ray machines of the type known as "Interrupterless transformers" were supplied to the department. Each machine consisted of a 10 h.p. petrol engine of the "Marine" type, a 2 k.w. generator, and a 2 k.w. transformer, supplied by Messrs. Waite and Bartlett, of New York. The two machines were similar, with parts interchangeable; so that if both broke down, one could be repaired by borrowing from the other machine. Consequently one apparatus has always been in working order. Each machine can be taken apart and packed in four boxes for transport, and four men can carry the heaviest box (480 pounds). Of thirty-two tubes despatched, nine arrived broken, so that there were twenty-three with which to start work. All the tubes were seven inches in diameter, with solid tungsten targets. All accessories, such as plates, paper, lamps, aprons, gloves, chemicals, etc., arrived undamaged and nothing was lacking in equipment.

The staff consisted of two captains and three orderlies. An extra orderly was required to carry patients when the department was particularly busy after the arrival of a convoy of wounded.

The department was opened on August 8th, 1915, when fourteen radiographs were made. On the third day eighty-three radiographs were made, as well as many fluoroscope examinations and localizations of foreign bodies. On this occasion one machine was at work from 8.30 a.m. to 7 p.m., and broke down. The armature burned out owing to too constant and prolonged use. No precautions had been taken to save it, the requirements of the patients alone having been considered. The other apparatus was subsequently in daily use and precautions were taken that it was never overtaxed. It is still in perfect order. A new armature was ordered and despatched from New York, August 21st, by Messrs. Waite and Bartlett by steamship; it arrived three months later. The burnt armature was sent to London to be repaired.

When an examination of a patient was required, the following requisition form was filled out by the medical officer in charge of the case, and sent to the department:

CANADIAN GENERAL HOSPITAL—*X*-RAY DEPARTMENT

Surname.....
First Name.....
Regimental No.....
Unit.....
Brigade or Division.....
Nationality.....
Injury.....
Wounded at.....
Ward.....
Provisional Diagnosis.....
Information Desired.....
Referred from.....
Patient can walk.....
Patient requires a stretcher.....

This form was taken to the ward by an orderly from the department, who, with the help of the ward-orderly, returned with the patient. The ward-orderly also assisted with the return of the patient to the ward. Of course, if the patient could walk the ward-orderly was not required. All requisitions were attended to the same day as required, but on three occasions, owing to pressure of work, it was necessary to leave the less urgent cases over until the following day. This delay was due to the lack of the second apparatus, the length of time required to move a seriously wounded, helpless patient, the heavy rain, and the darkness which rendered the transport of patients both difficult and dangerous after 5.30 p.m. At no time did any patient suffer from want of *x*-ray attention.

By the use of paper, instead of plates, in preparing radiographs, it was possible, when required, to let the surgeon see an *x*-ray photograph of his case one minute after the photograph was taken. As a general rule, radiographs were ready for inspection half an hour after the photograph was taken, but it was found more practical to show the radiographs to the surgeons during the evening as time was lost if the work was stopped during the day in order to consult with the surgeons. From August 8th to November

5th, 1915, fifteen hundred and forty *x*-ray photographs and many fluoroscopic examinations were made. *X*-ray treatments were given for sycosis, rodent ulcer, and exophthalmic goitre. No *x*-ray burn or other untoward effect was caused to patients or staff. Stomach examinations by barium meals were carried out when required. The nature of the findings was approximately in the following proportions: foreign bodies, 60 per cent.; negative diagnosis, 30 per cent.; fractures, 5 per cent.; diseases, 5 per cent.

The methods of localization employed were: a modified Mackenzie Davidson method; stereoscopic; anterior, posterior and lateral views, with metal ring on wound of entrance; fluoroscopic localization; placing a needle with its point in contact with the foreign body, using the fluorescent screen for the purpose; "Snook's" modification of Sweet's method for foreign bodies in the eye. The first-mentioned method proved very satisfactory and was used almost exclusively, except for foreign bodies in the eye.

In keeping records, the method adopted was that which had been used in civil practice for many years, namely, a numerical book, a card index of names of patients, a card index of diseases. The fortnightly supply of plates, paper, chemicals, etc., was received regularly and the department was never obliged to cease work through want of supplies.

The author concludes: "Coming as we did to unknown conditions, it has been a source of great satisfaction to us that every case has been as well treated in this department as it would have been in a large civil hospital. The quality of the radiographs has been as good as that seen in civil practice. The apparatus has been in good order every day so that no day passed when *x*-rays could not be had."

Medical Societies

CANADIAN MEDICAL ASSOCIATION

Financial Statement

The financial statements for the years 1914 and 1915 are here presented.

As compared with 1913 it will be noted that there is a decrease in receipts of about $600.00. This was largely due to the decrease in collections at the St. John meeting. The overdraft of

$707.73 at the end of 1914 is partly accounted for by an overdraft of $202.97 from 1913. During the year 135 new subscriptions were received, half of this number at the annual meeting. There were 274 discontinuances, 42 on account of nonpayment of fees, 26 left on active service, and 6 due to death. The net decrease in membership for the year was 139.

CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDING DECEMBER 31st, 1914

Receipts

Total annual fees	$6,513 66		
Reprints	343 11		
Total receipts		$6,856 77	
Balance, bank overdraft December 31st, 1913		707 73	
			$7,564 50

Disbursements

Bank overdraft, January 1st, 1914			$203 97	
JOURNAL account			2,939 45	
Reprints			346 22	
Editorial allowance paid			1,125 00	
Montreal Medical Journal Co., payment to stockholders ($5,000.00 at 6 per cent)			300 00	
Refunds paid affiliated provincial associations:				
Ontario	1914	$248 00		
British Columbia	1913	35 50		
Alberta	"	51 50		
Saskatchewan	"	36 50		
Manitoba	"	59 50		
New Brunswick	"	26 00		
Nova Scotia	"	38 50		
			$495 50	
General expenses:				
Salary, secretary-treasurer		$1,083 33		
Salary, stenographer		540 00		
Stationery		57 40		
Postage and sundries		105 00		
Audit fee		50 00		
Travelling expenses		100 19		
St. John meeting		197 49		
Sundries		20 95		
			$2,154 36	
				$7,564 50

Comparing the 1915 statement with that of 1914 it will be seen that the ordinary income of the Association shows a decrease of a little over $725.00. This, together with the bank overdraft of $707.73 would make a total deficit for the year of roughly $1,433.00. This, however, has been overcome and a surplus for the year of

$32.82 is shown. This is accounted for by the fact that no salary was paid to the Acting Secretary-Treasurer, and certain sums due as dividends to some of the members of the Association were generously donated by these members.

10 new subscriptions only were received during 1915, while for various reasons, the discontinuances amounted to 199. The net decrease in membership was 189.

CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDING DECEMBER 31st, 1915

Receipts

Total annual fees	$5,788 24	
Reprints	370 20	
Total receipts		$6,158 44

Disbursements

Bank overdraft, January 1st, 1915		$707 73	
JOURNAL account		2,751 04	
Reprints		444 35	
Clippings		40 00	
Editorial allowance paid		601 65	
Montreal Medical Journal Co., payments made this year		144 00	
Refunds paid affiliated provincial associations:			
Ontario 1915	$210 00		
British Columbia 1914	38 00		
Alberta "	57 00		
Saskatchewan "	30 00		
Manitoba "	61 50		
New Brunswick "	68 50		
Nova Scotia "	52 00		
		$517 00	
General expenses:			
Salary, secretary-treasurer	nil		
Salary, stenographer	$645 00		
Stationery	67 00		
Postage and sundries	140 00		
Audit fee	20 00		
Sundries	47 85		
		$919 85	
Balance in bank		32 82	
			$6,158 44

ONTARIO MEDICAL ASSOCIATION

THE thirty-sixth annual meeting of the Ontario Medical Association was held in Toronto May 31st, June 1st, and 2nd.

Five addresses were delivered on the first day before the General Session. Professor A. D. Blackader, of Montreal, spoke

on "Drugs and medicinal agents, considered from the professional, economic, and national standpoints." It was stated that the formulæ should be known of all preparations prescribed and that the use of all patented names upon prescriptions should be avoided. The true chemical name or the name used in the British Pharmacopœia should be the only one employed. Since the war had started many new Canadian drugs had been manufactured and these in nearly every case had been eminently satisfactory. After the war was over home made or British made drugs should be favoured. The full text of this paper will be found elsewhere in this issue. In discussing this paper Dr. Rudolf, of Toronto, stated that it had been the custom of the German government to give a bonus to their new drug manufacturers until they had driven other manufacturers off the market by underselling them. To meet this he suggested that after the war all German drugs should be heavily taxed. A notification from the Dominion government regarding an impending revision of the bill for the sale of patent medicines was then read, and a committee was appointed to make representations to the government in respect to this.

Dr. J. F. Percy, of Galesburg, Illinois, then addressed the meeting on the "Problem of heat as a method of treatment in cases of inoperable uterine carcinoma." Cases were quoted in which much improvement had resulted from the application of varying degrees of heat by means of special apparatus which was described in detail.

"Tonsillectomy with its general results" was the subject of a paper by Dr. Justus Matthews of the Mayo Clinic of Rochester, Minnesota. The type of operation generally employed and the results obtained were described. It was the custom in this clinic to perform the operation under local anæsthesia. In a series of several thousand cases practically no bleeding had occurred as a complication.

The presidential address was then delivered by Dr. H. B. Anderson of Toronto (see page 481 of the June issue of this JOURNAL). In his opening remarks Dr. Anderson stated that the meeting was taking place at a time pregnant with the most momentous issues since the dawn of the Christian era, under the shadow of the greatest calamity in history, with our Empire and her allies engaged in a death struggle to uphold the cause of freedom and justice against a military despotism, which, in the guise of Kultur, is seeking world power with the ethics and by the methods of barbarism. The official historian in describing the battle of Ypres was quoted

as saying that "the members of the Canadian Army Medical Corps rivalled in coolness, endurance and valour the men of the battalions who were their comrades". Burdens had fallen upon the members of the medical profession left behind, but these had been cheerfully undertaken not only as a duty but as a privilege. The Association had put forth special efforts to help to solve the problem of the injured soldier and had already received notice that the government of Canada was indebted to it for the splendid spirit which it had shown. In regard to drugs we must not, hereafter, recognize a dual system of medical ethics under which state-controlled professors in German clinics may advertise in text-books and trade literature, patented or trade-marked preparations, in a manner contrary to our code, nor should we allow ourselves to second their efforts by prescribing those products as if there was some peculiar virtue attached. The medical profession should learn to place its dependence on the carefully appraised preparations in our national pharmacopœias, which should contain all really useful remedies, rather than in the commercially-biassed catalogues of drug houses, with their too frequent irrational polypharmacy. In regard to the value of medical men in the war, Dr. Anderson said that there had never been such a demonstration of the national importance of a thoroughly trained medical profession. The service which scientific medicine had rendered in protecting our soldiers against typhoid fever, dysentery, cholera, and other scourges of armies, had saved tens of thousands of lives and trebled military efficiency. In conclusion Dr. Anderson thanked his fellow officers of the Association for their loyal support.

The address in medicine was given by Dr. Elliott P. Joslin, of Boston, who chose as his subject, "The treatment of diabetes mellitus." If cases were seen early they could be prevented from running an acute course, and if the urine was kept free from sugar there was seldom an opportunity for coma to develop. The preliminary treatment was to exclude fat, which is the source of the poisonous fatty acids, from the diet. The carbohydrates and proteids were then cut down as well, but it was dangerous to cut the proteids down below a certain percentage. After a certain amount of starvation the diet could be slowly raised again without necessarily causing a reappearance or an increase in the amount of sugar in the urine.

On the morning of the second day meetings were held in the sections of medicine, surgery, and gynæcology. In the medical section Dr. Gordon Bates, of Toronto, gave a paper on the "New

arsenical preparations in syphilis," Dr. George E. Smith, of Toronto, on the "Treatment of syphilis in children," and Dr. C. D. Parfitt, of Gravenhurst, on the "Indications for artificial pneumothorax." "A functional map of the floor of the fourth Ventricle" was the subject of a paper which showed much investigation by Prof. F. R. Miller of the Western University of London, Ontario. By employing the method of unipolar stimulation a number of functions had been localized in the floor of the fourth ventricle. Stimulation at the inferior fovea causes deglutition and reflex secretion from the homolateral parotid and submaxillary glands. These effects are probably produced by stimulation of afferent fibres continued in the fasciculus solitarius. At two points, situated at the level of the striæ medullares, submaxillary and parotid secretion is evoked. It seems probable that these results depend upon stimulation of efferent fibres proceeding from the respective salivary nuclei. From the dorsal vagus nucleus cardiac inhibition and peristalsis of the stomach and small intestine may be elicited. Dr. Julian Loudon, of Toronto, in discussing Dr. Miller's paper said that the deduction of the arching upwards towards the middle line of fibres from the deeper salivary nuclei in a manner similar to the arching of the seventh nerve upwards and around the nucleus of the six nerve, was an interesting fact which would likely be confirmed by histological investigation.

Captain G. D. Porter spoke on "Anti-typhoid inoculation in soldiers" and mentioned that good results were being obtained with less systemic reaction by the use of paratyphoid vaccine.

In the surgical section Dr. Olmstead, of Hamilton, gave an address on "Gall stones" and mentioned the necessity of thoroughly examining the surrounding organs in the course of an operation. The question of the removal of the gall bladder in these cases was discussed. Dr. W. E. Gallie, of Toronto, spoke on "Pyloric stenosis in infants" and said that if untreated the mortality was 100 per cent. If recognized and treated by pyloroplasty the mortality was about 25 per cent. The causation of the disease operated before birth, but was unknown. "Inflammatory growths of the bowel, simulating cancer" was the title of a paper by Dr. Herbert Bruce, of Toronto. Many cases, which had been diagnosed as cancer until the mass was removed and reported upon by the pathologist, were quoted. The following papers were also on the programme: "Significance of pain in the diagnosis of abdominal and pelvic disease" by Dr. S. M. Hay, of Toronto; "Appendicitis," by Dr. M. O. Klotz, of Ottawa; "Duodenal ulcer,"

by Dr. A. H. Perfect, of Toronto, and "Treatment of cancer by fulguration," by Dr. J. E. Hett, of Berlin, Ontario.

In the gynæcological and obstetrical section Dr. J. S. Kinnear, of Toronto, gave a paper on "Morphine and hyoscine in obstetrics" and advised the use of these drugs in prolonged labours, but not if delivery is expected within three hours as apnœa might result. Dr. Alan Brown, of Toronto, spoke on "Blood transfusion in hæmorrhage of the newly born" and described the technique of withdrawing blood from the donor into a syringe lined with paraffine. In his experience one case had died in a series of eight. Dr. Unger, of New York, then exhibited and described his apparatus for blood transfusion. In the course of his remarks he insisted that tests for hæmolysis should be made except in cases of emergency. The "Treatment of dysmenorrhœa" was presented by Professor Weir, of Cleveland, who insisted on the necessity of an accurate diagnosis of the underlying cause. In the "Treatment of eclampsia," Dr. J. S. Wardlaw, of Galt, advocated the use of morphine, elimination, and the early production of abortion.

In the afternoon of the second day before the general session Professor deWit Lewis, of Chicago, delivered a paper with lantern slides on "Cystic mastitis". He spoke of the tendency to a central location of the disease and discussed the diagnosis from carcinoma. The "Treatment of pneumonia" was the subject of a paper by Professor Solomon Solis Cohen, of Philadelphia. In the preface to his remarks Professor Cohen said that the heart of all the good people in the United States were with Great Britain and her Allies in her fight for freedom. He stated that Great Britain's war was a righteous struggle against aggression, and in our treatment of pneumonia we should endeavour to find the most effectual means of routing the Goths and Huns of the microscopic world. The best big gun which he had yet discovered was quinine, although he did not place his faith on this drug alone; but also employed inhalations, fresh air, good-nursing, etc. By the use of quinine in large doses over a period of twelve years, his mortality in all cases had been 16 per cent. He considered that quinine acted as a chemical antitoxin and neutralized the poisons of pneumonia. By its use one could often keep the temperature down and substitute a lysis for a crisis. Dr. Cohen's method of administration was usually the intramuscular and the doses given were larger than could be tolerated by normal persons. Dr. J. L. Davidson, of Toronto, in discussing this paper said that he had advocated and used quinine in large doses for many years in the treatment of pneumonia.

At the business session Dr. A. Dalton Smith, of Mitchell, was elected president for the ensuing year, and Toronto was decided upon as the place of meeting. The other officers elected were: vice-president, Dr. C. L. Starr, Toronto; treasurer, Dr. J. H. Elliott, Toronto; secretary, Dr. F. A. Clarkson, Toronto. Representatives to the Canadian Medical Association, Dr. H. B. Anderson, Dr. H. J. Hamilton, of Toronto, and Dr. G. S. Cameron, of Peterborough. Executive Committee, Dr. D. J. Wishart, of Toronto, and Dr. F. C. Neal, of Peterborough. At the conclusion of this session the members of the Association and ladies were entertained at Dentonia Park Farm, East Toronto, by Mrs. W. E. H. Massey who was assisted in receiving the guests by Dr. and Mrs. H. B. Anderson.

In the evening of the second day before the general session Drs. John A. Wyeth, John A. Bodine and C. H. Chetwood showed moving pictures of various operations to illustrate the surgical technique used in the New York Polyclinic Hospital. These pictures illustrated very clearly the various stages in actual operations, *e.g.* the bloodless operation for amputation at the hip joint, the operation for inguinal hernia under local anæesthesia, and the removal of a kidney for multiple calculi. "Mouth infections and some of the mechanisms by which they produce localized and systemic diseases," was the subject of a very interesting and instructive address by Dr. W. A. Price, of Cleveland.

On the morning of the third day there were further papers given before the medical, surgical, and gynæcological sections. Before the medical section Dr. L. G. Pearce, of Brantford, spoke on "Protozoan infections," such as malaria, syphilis, and sleeping sickness. Dr. Charles McKay, of Seaforth, spoke on "Pernicious anæmia" and quoted several cases. In discussing this paper Dr. G. W. Ross, of Toronto, said that he had found a streptococcus in the blood of the last four out of five cases examined, and believed the organism to be a constant invader of the blood in pernicious anæmia. The only cases under his care which had done well were those in which a transfusion of blood from another individual had been performed. "Duodenal feeding" was described by Dr. E. E. Cleaver, of New York, and the type of tube used was exhibited. Other papers given were "Radium as an accessory in the treatment of exophthalmic goitre" by W. H. B. Aikens, of Toronto; "Arterial hypertension" by Dr. H. A. Boyce, of Kingston, and "Prophylactic therapeutic inoculation with respect to common colds" by Dr. G. W. Ross and H. K. Detweiler, of Toronto.

In the surgical section the following papers were presented: "Fractures, including compound," by Drs. J. M. Rogers, E. Seaborn, and T. H. Middleboro; "The relative merits of the steel plate and bone graft in the treatment of recent fractures," by Dr. E. R. Secord, of Brantford; "The transthoracic operation for chronic empyema and bronchiectasis," by F. N. G. Starr, of Toronto; "Pulmonary abscess, following abdominal operation," by Angus McLean, of Detroit; "Renal calculi," by Dr. W. W. Jones, of Toronto; "Conservative surgery in injuries of the hand" by Dr. N. A. Powell, of Toronto; and "Considerations in the diagnosis and surgical treatment of gastric and duodenal ulcer" by Dr. J. K. McGregor, of Hamilton.

In the section of gynæcology and obstretrics, Dr. A. C. Hendrick, of Toronto, gave a paper on "Diagnosis and choice of operations in retro-displacements," and Dr. J. L. Bradley, of Creemore, spoke on the "Pathology and treatment of uterine hæmorrhage." "The female pelvic floor, and the part it plays in obstetrics and gynæcology," was the subject of an address, illustrated by moving pictures, by Professor T. H. Morgan, of New York. The pictures showed an operation for perineorrhaphy by Dr. Morgan and demonstrated the most highly perfected technique employed in this operation. Dr. Weir, of Cleveland, and Dr. F. A. Cleland, of Toronto, took part in the discussion of this operation, and complimented Dr. Morgan on being able to bring before them such an exact reproduction of his excellent work. Dr. C. A. Page, of Oakville, presented a paper on "Persistent occipito-posterior positions in relation to the country practitioner." Owing to lack of time Dr. R. A. Arthur, of Sudbury, and Dr. K. C. McIlwraith, of Toronto, did not read their papers on "The Walcher position in obstetrics" and "The use of pituitary extract in obstetrics."

On the afternoon of the third day the military session under the patronage of His Honour the Lieutenant-Governor of Ontario, was commenced. The first paper was by Dr. Goldwin Howland, of Toronto, on "Neuroses in returned soldiers." The paper was confined to a consideration of the various symptoms met with in the functional nervous cases which had attended the Central Military Convalescent Hospital in Toronto. The occurrence of various symptoms not commonly met with in the hysterical and neurasthenic cases of ordinary civil practice was commented upon, and several case reports were read to elucidate the speaker's remarks. The paper was discussed by Dr. Loudon, who had been associated with Dr. Howland in his work upon these cases. "Cere-

bro-spinal meningitis among soldiers" was the subject of a paper by Captain Fitzgerald and Captain McClennahan, of Toronto. It was pointed out that some of the rather unsatisfactory results in the treatment of this disease when it first occurred were probably due to the inability to obtain proper anti-meningococcus serum. "Effects of poisonous gases as shown in returned soldiers" was given by Dr. J. H. Elliott and Dr. H. M. Tovell, of Toronto. Dr. Elliott stated that it was now proved that the Germans had been experimenting for years in their laboratories on the effects of poisonous gases upon animals with the idea of using the most harmful of them in warfare. The gases which had been used by them were for the most part chlorine and bromine. These gases produced all degrees of asphyxia, and the effects depended to a great extent upon the length of exposure and the concentration of the gases. Those who succumbed early died of acute pulmonary congestion and œdema of the lungs. In such cases the lungs were found to show congestion and œdema with large areas of acute emphysema, yellowish exudation and subpleural hæmorrhages. The symptoms were a sense of constriction about the throat, a feeling of oppression, dyspnœa, cyanosis, and expectoration of mucous and blood. *X*-ray plates from cases at the Central Military Convalescent Hospital of Toronto were exhibited. These showed large coarse strands of fibrous tissue running outwards from the hilus of the lung. Some cases had been followed by tuberculosis. Colonel Marlow, A.D.M.S., next spoke on "Medical problems involved in the classification, treatment, and final disposition of invalided soldiers."

The meeting then adjourned to attend a garden party which was held at "Ardwold", the beautiful home of Sir John and Lady Eaton. The guests were received by Sir John and Lady Eaton, Dr. and Mrs. H. B. Anderson, and Mrs. Timothy Eaton. Several bands were in attendance as well as many of the men of the 110th Irish Regiment of which Sir John is Honorary Colonel.

In the evening of the same day "The problem and plans of the Military Hospitals' Commission in dealing with invalided soldiers" were discussed by Senator J. S. McLennan, and Professor Stephen Leacock, of McGill University, spoke on the "Economic problem presented by the treatment and disposition of returned soldiers." Professor Leacock said that just as the gathering together of great armies was a task almost beyond belief, so would the strain upon our economic machinery to rehabilitate these armies at the declaration of peace be stupendous. The

government had, he thought, done marvelously well with the problems now before it. The statement and belief of many that war brought prosperity was absolutely fallacious, although the feeling that England would be faced with dire poverty shortly after the declaration of war had not been borne out in fact, as never was prosperity greater and employment more easily obtained. War would leave no added prosperity, and, just as the war was colossal, so too must be the poverty that would come after it. The future of Europe would be worse than that of Canada, as in Canada an influx of people would be followed by money from the States for the development of our vast and almost untouched natural resources. The problem of the partially disabled was one that would have to be fought and wrangled about. The most serious problem, however, was that of the men of the disbanded armies. Many of them would never be content to return to the dull narrow life of the lowly workman; but after the task of the open air and sunshine would demand outside work, their just heritage. In Canada, at least, the opportunity would be great, but it was not only the Canadian but other soldiers also that would have to be looked after, and this was a matter that would require the coördination of the whole Empire. War had suddenly awakened the world to the fact that everyone must look after everyone else. After saying that every man must fight it would be impossible to refuse them the chance to live. Either work or bread must be provided. The problem must be solved in Canada in conjunction with the other parts of the Empire.

The meeting closed by passing a vote of thanks to the retiring president, Dr. H. B. Anderson, for his efforts in bringing about the best attended, the most interesting, and instructive meeting in the history of the Association.

THE ONTARIO HEALTH OFFICERS ASSOCIATION

The fifth annual conference of the Health Officers of Ontario was held at the University of Toronto, on the last two days of May. Dr. A. J. Macauley, medical officer of health, of Brockville, vice-president, presided in the absence of the president, Dr. Macpherson, of Peterborough, who is on active service.

The first forenoon of the meeting was taken up in a lengthy and animated discussion of measles following the reading of a paper by Dr. M. B. Whyte, superintendent of the Isolation Hospital,

Toronto, upon "The quarantine period for measles." Dr. A. Dalton Smith, medical officer of health, of Mitchell, and Dr. V. A. Hart, medical officer of health (Vespra), Barrie, also presented papers upon "Measles," and "Should the breadwinner be quarantined?" The concensus of opinion seemed to be that the present quarantine of three weeks with a sixteen day exclusion from school following exposure was of too great length. It is generally considered that measles is infective for from three to five days before the rash appears and for not longer than seven days following the rash, perhaps even shorter than seven days, and that the exfoliation, third persons and fomites do not carry the disease. Second attacks are quite rare, consequently persons who have had the disease need not be quarantined. Those who have not had the disease should be held under quarantine for two weeks after last exposure. Those who suffer from the disease should be quarantined for seven days after rash appears unless there are discharges or nose bleed.

The discussion of this subject will probably induce the Provincial Board of Health to make some relaxation in the present regulations.

Dr. Frederick Adams, epidemiologist of the Toronto Health Department, read a paper entitled, "Some obersvations on typhoid fever in Toronto," in which he outlined the means taken to produce the much lessened incidence as well as the death-rate from this disease in the last six years. In 1910 the death-rate from typhoid in Toronto was 40 per 100,000. In 1915 it had reached the phenomenally low rate of 1·9 per 100,000, the lowest rate for any of the large cities of America. The chief factors in this condition of affairs were announced to be—chlorination of the water supply, pasteurization of all milk except certified milk, and the campaign against flies and outdoor privies.

The Health Department of Toronto deserves the strongest commendation for its success in abating this preventable disease.

Dr. J. G. Fitzgerald read a short paper upon "Epidemic cerebro-spinal meningitis," giving the marked features of the disease and advising the necessity of its early recognition by means of spinal puncture. The treatment is by repeated puncture and injection of anti-meningitis serum with careful feeding, guarding against relapses and the use in persistent cases of autogenous vaccine.

The occurrence of this disease among the troops has given peculiar advantages to those studying the disease, for the reason

that it is diagnosed early and energetically treated. During the past season all the cases among troops in Military District No. 2 have recovered.

At the afternoon session the acting president, Dr. Macauley, gave an interesting address dealing with the value of the free distribution of antitoxin, and other biological products by the Provincial Board of Health. He also referred to the necessity of the prevention of pollution of public water supplies, and described how his own town of Brockville was proceeding in the direction of a safe water supply.

The feature of the session was a paper by Dr. W. H. Park, director of the Public Health Laboratories of New York City. Dr. Park has a charming personality and is well known to public health and medical men as an advanced authority on diphtheria, upon the diagnosis and treatment of which his paper treated. He advised the use of diphtheria antitoxin in large doses, and showed by comparison of results that the intravenous use of antitoxin was much more effective than either the intramuscular or the subcutaneous. In ordinary cases in the child, he gives three to five thousand units intravenously. In severe cases five to fifteen thousand units with correspondingly large doses in the adult. Laryngeal cases require early and large dosage.

Dr. G. R. Cruickshank, medical officer of health of Windsor, read an original and interesting paper upon the subject of "Adenoids and tonsils," advancing reasons for the belief that these organs are responsible for a great deal of infection in early life.

Following a free discussion of this subject by Doctors Hill, Varden and Dewar, Dr. F. A. Dales, medical officer of health, read a paper entitled, "Suggestions for improvement of association meetings," citing the following problems for discussion, viz.:

1. Are our quarantine methods satisfactory?
2. What changes, if any, are necessary?
3. What are the reasons for such changes?
4. Should there be separate sections to discuss health matters affecting cities and towns and for rural communities?
5. Salary of health officers.
6. Payment for reports of births and deaths.

In regard to the latter it came out in discussion that the reporting of births and deaths was a duty the physician owed to the State, and that while there seemed to be some ground for the question of payment for reports of notifiable diseases the physician should have sufficient interest in his patient's baby to notify its birth.

A paper on "Deductions of a New Ontario medical officer of health," by Dr. Edgar Brandon, medical officer of health, North Bay, gave an insight into the necessities and difficulties of health officers in the newer and rapidly growing towns of the province where the influx of foreigners and varied elements make that officer's task no sinecure.

The public meeting held in Convocation Hall in the evening was largely attended. A most interesting and instructive lecture upon sanitation in Serbia was given by Major W. D. Sharpe, who served as surgeon with the British Naval Hospital in Belgrade, in the first year of the great war. The lecture was illustrated by a large number of slides. He was followed by Captain Ruggles George, A.M.C., who gave a most interesting story of the first contingent illustrated by slides which carried the troops through Valcartier Camp, Salisbury, and for some months in Flanders. Captain George certainly made good use of his spare time and powers of observation while on active service.

The second day's proceedings were begun by an excellent paper upon "Auxiliary aids in public health work," by Dr. H. W. Hill, medical officer of health, London. In this paper Dr. Hill discussed the various means whereby public health measures may be advanced, laying particular stress upon publicity of public health education by means of lectures, leaflets, moving pictures, health exhibits, newspaper propaganda, etc., etc. The matter received a thorough discussion, among those contributing being Dr. Murphy, of Minnesota, Dr. Hastings, Dr. Cruickshank, and many others.

Dr. P. J. Moloney, district officer of health, read a splendid paper upon "Rural sanitation," and F. A. Dallyn, Esq., the provincial sanitary engineer, read a portion of an exhaustive paper upon "Methods of collection and disposal of domestic wastes in small municipalities." These papers have great value and when they appear in the journals will be read with much interest.

The morning session was concluded by a paper upon "The treatment of sewage by activated sludge," read by T. Chalkley Hatton, chief engineer of the Milwaukee Sewerage Commission. This paper which will appear in the *Public Health* and other journals should be carefully studied by medical and other municipal officers, as it seems to indicate a comparatively cheap and most effective treatment of one of the greatest problems, viz.: sludge treatment in the disposal of sewage. Mr. Hatton has carried out extensive experiments in sewage treatment, and is an engineer of repute in

the United States. His remarks were listened to with more than ordinary interest.

Dr. H. Logan, medical officer of health of Niagara Falls, gave a paper on the "Prevention of tuberculosis in children." This was discussed by Doctors Alan Brown, Kidd, and Hastings.

Dr. J. S. Nelson, of Westboro, read a paper on "Water supply and sewage disposal for suburban residences," and E. C. Henderson, Esq., of London, described the forms used by him in keeping records of communicable diseases.

This meeting was perhaps the best in point of papers and discussions yet held by the Association. It is intended to hold the next meeting in Toronto on the last Tuesday and Wednesday of May, 1917.

The officers elected were: Dr. A. J. Macauley, president; Dr. T. W. Vardon, vice-president; Dr. J. W. S. McCullough, secretary.

Committee on Papers and Arrangements: the officers-elect and, Dr. W. A. Crain, Crysler; Dr. W. McBain, Rainy River and Dr. J. A. Roberts, Hamilton.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The eleventh regular meeting of the society was held Friday evening March 3rd, 1916, Dr. F. A. L. Lockhart, president, in the chair.

Case Reports: (1) Penetrating gastric ulcer, with specimen.

(2) Congenital pyloric stenosis, living case, by Dr. E. M. von Eberts. The report of these cases appears on pages 604-606 of this number of the Journal.

Discussion: Dr. G. G. Campbell: The child came to my outpatient clinic with the history which Dr. von Eberts has given. The child was stripped and put on its back on a table and as soon as I looked at it I could see peristaltic waves passing over a prominence in the abdomen to the left of the centre line just below the costal margin. On palpating, I could distinctly feel just in the centre line a mass which appeared about as big as the end of my index finger. The situation of the mass led me astray and I could not make up my mind what it was. We tried the effect of a large enema, which as you have heard was quite successful and the symptoms entirely disappeared for two or three days and the question then was just what we had to deal with. The symptoms came on again in an aggravated form and the same conditions

were noted except that one could not feel any mass in the abdomen where it had been originally felt. The fact that the bowels moved with the enema, and the absence of blood or mucous in the stools, showed conclusively that it was not an intussusception and we considered the possibility of it being a pyloric stenosis.

These cases are more common than one would expect and now they are being more generally recognized. They are generally first recognized about the third week of the child's life, for during the first two or three weeks the stomach either enlarges rapidly or the amount of food taken is small, and the vomiting, if any, is not paid much attention to. About the third week it becomes worse and, on palpating, the peristalsis and the mass is recognized. The diagnosis cannot be definitely made unless one can palpate the hypertrophied ring at the pylorus and it is easier to make it out when the child has lost some of the plumpness which it had at birth. So far as the treatment is concerned we can divide these cases into two classes. The obstruction is a mechanical one. In the first class the orifice is so small that it is impossible for food to pass through and nourish the child, in the other there is a narrowing of the pylorus which may become almost closed with spasm. The pyloric irritability may pass off at times and things go smoothly for a while and then another spasm with vomiting may occur. We had a case of this type some time ago which did all right until it was put on artificial food, then vomiting persisted and the child lost weight. Dr. von Eberts did a gastroenterostomy which was successful, but unfortunately the child had had pneumonia before coming into the hospital and developed from this an otitis media which spread to the meninges and it died from brain symptoms. At autopsy it was shown that the operation was successful. The treatment suggested in the textbooks of washing out the stomach before attempting operation seems to me to be a great mistake. Give it the blandest possible sort of food; allow the child to nurse for shorter intervals than would normally be the case; and endeavour to prevent dilatation of the stomach by not overfilling it. If the condition can be prevented from becoming worse, in a good many of them the spasm seems to relax, or the pylorus increases in size, and sufficient food gets through to nourish the child. Once, however, these bad cases begin to go downhill rapidly and vomiting becomes persistent, it does not do to leave them too long.

Dr. E. M. von Eberts: What Dr. Campbell says about adhering to breast feeding and avoiding washings is very important. In one case which I saw the washings seemed to aggravate the

vomiting very much. If a wet-nurse cannot be obtained, or if the milk does not agree with the child, one has to resort to artificial feeding. Breast fed children certainly do better. In the present case the child has had practically no symptoms since operation.

PATHOLOGICAL SPECIMENS: Series by Dr. J. W. Scott.

1. Dissecting aneurysm of the aorta, showing healing after a previous rupture in the first portion of the arch.

2. Tuberculous meningitis.

3. Tuberculous peritonitis.

PAPER: The paper of the evening was read by Dr. A. E. Garrow who took as his subject, the treatment of gastric and duodenal ulcer. This paper appears in the current number of this JOURNAL.

DISCUSSION: Dr. C. K. P. Henry: There are several points in this paper on which I would like to speak. I have had an opportunity of operating on five cases of gastric or duodenal ulcer, three acute perforations and two for excessive hæmorrhage. In most of Dr. Garrow's perforation cases he has been in the habit of draining. Of my three cases one was secured within fourteen hours after perforation, one within four hours and the other ten hours. In these the suction apparatus was used for cleansing the peritoneal cavity, no gauze was used to swab and the abdomen was closed without drainage. The recovery from the operation was satisfactory and I felt that the removal of the septic material was exceedingly well carried out with this suction apparatus. I understood Dr. Garrow to say that he did not favour operating on cases of severe hæmorrhage. I have had two cases in which both had lost one to one and a half pints of blood, several hæmorrhages coming on without warning. One case had only four days' history of indigestion but had an ulcer ten or fifteen years before. The second case was that of a man who had a slight dizzy attack at his office, and the following day a most extreme degree of hæmorrhage. Dr. Malcolm saw him and sent him to hospital and his condition was despaired of for the first twenty-four hours. However, later I did a posterior gastro-enterostomy and he gained forty pounds in three months. As to operation in cases of extreme hæmorrhage the general feeling is that operation should be deferred. In my second case, a woman with a very large hæmorrhage, I did a gastro-enterostomy ten days after. She vomited once about two ounces of blood, otherwise she did well and gained fourteen pounds in weight inside of the first six months. As to the catheter feeding, to me

that is a new method and I think would have saved one of my cases. The perforation had been recovered from but it was felt that owing to the history he gave it was advisable to do a gastro-enterostomy, following which he had vomiting and lavage gave only temporary relief. A second operation was done eight days after and there was found to be a high up obstruction, a large amount of small bowel being greatly dilated. This case lived four days following entero-enterostomy which was done under local anæsthesia and I th nk if he had been fed by catheter he would have been tided over his extreme condition and a more satisfactory operation performed later on. In the appendix cases in the last year I have not drained any, even with general peritonitis; the suction apparatus seems to clean up the abdomen so efficiently that it seems folly to try to drain with tubes. I thank Dr. Garrow for his paper to-night and for the very interesting points which are so hard to find even in the literature. The cases which we get at first hand teach more than can be got from any text-book or any amount of literature.

Dr. W. F. Hamilton: One of the difficulties in which many of us are placed in regard to treatment of these very large hæmorrhages is that gastric ulcers are very often latent and the previous history of a serious ulcer and of erosion are alike. One of Dr. Garrow's worst ulcers was found in a man who had never given any sign of ulcer previous to two weeks before his operation. I have seen more than once alarming hæmorrhages from the stomach in those who have given no previous history whatever of gastric ulcer and I distinctly recall two patients who have had hæmorrhages so severe that it would be impossible for any of us who have not had experience to believe that such an amount of blood could have come from small, practically invisible, areas in the stomach. In these two cases the blood came both by the bowel and the stomach and produced in a very short time such a degree of pallor and change in the appearance of the patient that it gave extreme anxiety. When one admits that hæmorrhage may be very copious from even the latent ulcers, one must admit that the absence of previous history is not the best evidence to go by. Dr. Garrow has spoken with firmness concerning the time to interfere or not to interfere in these cases; "if they cannot be cured medically they cannot be cured surgically." The difficulty is to stand by and see a patient bleed to death, for I have not yet discovered any means of knowing when we have the small erosion to deal with. I admit that my case with Dr. Garrow and that with Dr. Armstrong went badly, this for the time being supporting Dr. Garrow's view.

Dr. E. M. von Eberts: I would like to lay emphasis upon what Dr. Garrow says with regard to medical treatment. A great many cases come to the surgeon because the primary medical treatment is inadequate. The histories frequently show that an individual after a first attack, or during the first attack, receives a short course of medical treatment which relieves the symptoms, but does not cure. A great many cases could be cured at the time of the first attack if the medical treatment were continued longer, and if it were possible to induce patients who felt well to continue their treatment for a longer period. A number of the chronic cases which come to the surgeon could have been cured in the initial stages. When once a pre-pyloric and duodenal ulcer becomes chronic, there is not very much hope from medical treatment, for the simple reason that, though it may heal, healing almost invariably leads to obstruction. I have seen several of these chronic cases which improved greatly under medical treatment, but eventuated in serious pyloric obstruction, and a gastro-enterostomy had to be performed to relieve the obstruction. I am also interested to hear Dr. Garrow say that he has abandoned the use of occlusion. Personally I have never employed it except for two definite indications. I think that in duodenal ulcer, where hæmorrhage has been recent, occlusion by plication is possibly justifiable. The other indication is, I should say, in those cases where, owing to the existence of perigastric adhesions involving the lesser sac behind the pyloric portion of the stomach, it is not possible to place the opening to the right of the line of the cervical portion of the lesser curvature. In other words, if the anastomosis can not be placed well within the pyloric portion of the stomach, occlusion by plication may be justifiable. We know from *x*-ray experiments that gastro-enterostomy is not a measure which results in drainage of the stomach, and, if the opening is placed in the fundal portion, the bismuth meal may be seen to pass for the first two hours continuously by the normal route.

As to the use of the fascial band, it has been shown that it increases the vomiting after operation and certainly adds to the hazards of the undertaking.

I should like to ask Dr. Garrow what he thinks is the physiological *raison d'etre* of gastro-enterostomy. Many surgeons agree that the favourable results and healing following gastro-enterostomy are due, not to the diversion of the food stream, but to the fact that the hyperacidity is overcome, either by neutralization, reflex action, or the action of hormones.

An interesting point is that chronic indurated ulcers, treated successfully by gastro-enterostomy, very rarely return with carcinoma. Whether the admission into the stomach of the alkaline juices gives the protection which the small bowel enjoys normally, is also a moot question.

Dr. G. E. Armstrong: In the whole subject of the treatment of gastric and duodenal ulcers and their complications, the questions arising are so numerous that one can only touch upon two or three. The first one which has excited a great deal of interest, is the question of occlusion; that question has been before the profession for just thirty years. The first time I visited Vienna, von Hacher was actively engaged on this subject and he did it by plication. It was practised by all of us doing gastric surgery for many years and some of us thought it did good. I think the present view, with which I am thoroughly in accord, is that the subject has been worked out to a finish and the only thing new I have seen is practised by a young man working in the laboratory of the Michael Reis Hospital, Chicago. He places a fascial band between the muscularis and the submucosa of the duodenum, a broad one, brings it round and sews it. In dogs, up to nine months and afterwards the occlusion has been absolutely perfect. Our smoothest recoveries occur in those cases with pyloric stenosis. If the gastro-enterostomy opening is put up in the antrum near the canal of Jenesco, the food will go through the new opening; if the pylorus is patent some may go through the pylorus but the chief bulk will go through the gastro-enterostomy opening. If you go to the other extreme and put the opening at the fundus, vomiting will occur even if there is pyloric occlusion, and a good many of them vomit until they die.

The question of hæmorrhage is also most interesting and I want to speak on two points in this connexion. We have three kinds of hæmorrhage at least before us; the small leaky hæmorrhages coming gradually, month by month and year by year, producing a definite anæmia which does not yield to treatment and should be subjected to surgical interference. We have large hæmorrhages in patients with a history of gastric ulcer. We put those patients to bed, no food, give them medical treatment, morphia, ice bags, and if after that they continue to have another large hæmorrhage, the wise way is to interfere and interfere promptly. We have it stated by a man with the authority of Moynihan that a gastro-enterostomy is all that is required and it is all that he ever does, and he has never lost a case when he has done that.

Other men have, however, and probably the true explanation is if your bleeding ulcer is in the pylorus the contractile part of the antrum, your gastro-anastomosis, by preventing dilatation arrests the hæmorrhage; if in the fundus they will go on bleeding as much as before unless you control the hæmorrhage from that ulcer by local treatment. The third class is a different proposition. These cases come before us with tremendous hæmorrhage and without any previous history at all. They occur sometimes in young men without any history. In those cases we do not save very many if we do not find where the hæmorrhage comes from. They are a class where we cannot find anything—the point from which the blood escapes—there is an ooze all over that stomach wall and they die, and the pathologists cannot find any one point from which the hæmorrhage came. Now in those cases, whether due to infection or not, in some of them with a similar history we find an ulcer and it is just that point that I want to make, and I make it especially because this point has been before the surgical societies for discussion and they have taken two sides in the matter. I would not like to stand by without making an effort to save these people. In the first place we may have a gastric or duodenal ulcer without previous history, the hæmorrhage may be coming from one of these ulcers and we may be able to deal with it. I have found erosions, fissures, which thoroughly treated by cautery have not bled any more, and these patients simply by a gastrotomy and opening the stomach, and closing again, have gone on well and recovered. Until we positively are able to exclude cases of ulcer of different varieties it is not quite the thing to stand by and not try to save these people, although in some of them we may fail. I was rather hoping that Dr. Hamilton and other physicians would take up the question of the excision of gastric ulcers in reference to their etiological relationship to the development of malignant disease. That is a matter of much interest. Very often I think these ulcers heal and very seldom give rise to anything else. I think it is a pretty safe proposition to make that where gastric cancer develops for the most part there is a previous lesion, but that is different from saying what proportion of gastric ulcers become malignant. I would say that if a gastric ulcer is accessible and can be removed without increasing the hazard to the patient it is a good practice to excise it, but if it cannot be excised without increasing the hasard it is better not to do it. Another point is to funnel the stomach. Those who are familiar with the gastro-enterostomies know that we bring the stomach down through the slit in the transverse

meso-colon. Sew that away up on the stomach wall so that you make a funnel and if you want to do it well and nicely do the posterior part of the sewing before you have done your gastro-enterostomy. There are many other points which one could take up on this interesting subject but that is all I will mention to-night.

Dr. F. R. England: I wish to express my appreciation of Dr. Garrow's paper. I share his opinion, namely, that given a definite case of gastric or duodenal ulcer, operative treatment is the proper, if not the only treatment. In the case of a gastric ulcer excision of the ulcer is to my mind the most rational practice. In duodenal ulcer it is a different matter and experience has taught that good and satisfactory results may be obtained by performing a gastro-jejunostomy and nothing more. I recall a case which I operated on several years ago for severe hæmatemesis and malæna. The patient was a man fifty-eight years old who gave a history of dyspepsia for over twenty years. A tumour was palpable in the epigastrium and his general condition was very poor. It was feared that if another hæmorrhage occurred he would die. Gastro-jejunostomy was performed and recovery was prompt and uneventful, no further bleed ng occurred and he left the hospital in less than three weeks. The tumour promptly disappeared and the patient still continues well and is enjoying much better health that he did for years prior to the operation.

If dealing with a gastric ulcer, where from its situation it cannot be readily excised, then possibly one had best be satisfied to leave the ulcer and simply do a gastro-jejunostomy; one's own experience must guide him in these cases. About three years ago I excised a saddle ulcer. The patient was a man forty-one years of age. All was well for six months when symptoms of pyloric stenosis appeared. A gastro-enterostomy was done, giving complete relief and the patient has since joined one of the regiments and gone overseas. I have never practised occlusion in any of my cases. Dr. Garrow's employment of jejunostomy for the relief of symptoms of obstruction is a good idea and something to be remembered and practised in such desperate cases.

Dr. Garrow: I quite agree with Dr. Henry on the question of drainage. Early operation and thorough cleansing by suction obviate drainage. Late operations with much soiling and considerable peritoneal reaction should be drained by a suprapubic incision for from twenty-four or forty-eight hours.

While I agree in the main with Dr. Hamilton's remarks, I am still convinced that acute fulminating hæmorrhages, occurring

without any previous history of chronic ulceration, are not suitable for surgical interference. Repeated hæmorrhages with a history of ulceration demand surgical intervention.

The application of the facial bond to the submucosa and covering it over by suturing the peritoneal and muscular coats, as described by Dr. Armstrong, is time consuming and difficult to perform. Moreover, experimentation shows that it, like other methods, may fail to ensure permanent occlusion.

In answer to Dr. England's question I would say, if excision of an ulcer is feasible and does not add materially to the risk, then do it. In many cases, however, it is impossible, too hazardous, and not to be considered.

MEDICAL LIBRARY ASSOCIATION

The nineteenth annual meeting of the Medical Library Association was held in Detroit on June 12th and in Ann Arbor on June 13th. Nearly all the most important American medical libraries were represented and two Canadian ones—the Toronto Academy of Medicine and the Library of the Faculty of Medicine of McGill University. In addition to the discussion of questions of great library interest, several points of particular interest to the medical profession were considered. Of these perhaps the most important was the question of arranging bibliographical material; it was suggested that all references be arranged uniformly, according to the year, volume, and page. Instruction in the use of the various indices and bibliographies was recommended as being of practical value to the medical worker. It was also thought that by presenting to the profession the difficulties experienced by libraries in obtaining reprints, the authors might be induced to supply these more liberally to the various libraries of the Association. The question of not printing the third series of the Index Catalogue of the United States Surgeon-General's library was another point brought up before the association: a resolution was passed that the Medical Library Association send a preamble to the Surgeon-General's Libarry that this series be continued, as it was felt that a great loss would be sustained by the libraries and medical profession if they were dependent solely upon the Index Medicus and the special bibliographies.

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Annual Meeting, Vancouver, B.C., 1915, postponed.

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EDMONTON ACADEMY OF MEDICINE:—President—Dr. C. U. Holmes. Secretary-treasurer—Dr. E. L. Garner. Library, 12 Credit Foncier, Building.

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THE TREATMENT OF DIABETES MELLITUS

By Elliott P. Joslin, M.D.

Boston

RATHER more success is achieved by surgeons in the treatment of general peritonitis than is attained by physicians in the treatment of diabetic coma. In neither condition are the statistics flattering to the profession; but the successes obtained by our surgical colleagues in the prevention of general peritonitis make the failure to prevent coma as a cause of two out of every three diabetic deaths mortifying to say the least. We physicians should begin to regard diabetic coma in the same light as your British brother, Mr. Moynihan, has taught the medical fraternity to look upon the late stages of a neglected gastric ulcer—namely, as an emergency which should not have been allowed to arise.

With this issue of the prevention of diabetic coma plainly to the fore as the cardinal point in the treatment of diabetes, it is pertinent to inquire what diabetic patients are most susceptible to coma? And your own experience will enable you to anticipate that the answer, which an analysis of my own fatal cases shows, will be children. Of the sixty-two diabetic children under the age of fifteen who have died under my care, coma was the cause of death in all, and the significance of this melancholy fact is this: that where diabetes appears in its most severe type, as in children, coma is its expression. The propositions are simpler to state than to execute —first, that the best way to avoid coma is to prevent the progress of a case of diabetes from the mild into the severe type, and second, to protect the patient from all those agencies such as infections, anæsthetics like chloroform and ether, undue exertion (mental or physical), which tend toward intensifying the severity of the dis-

Address delivered before the Ontario Medical Association, June, 1916.

case. For if the diabetes is kept mild or moderate the coma need not be feared.

Next to the children in the frequency of death from coma, strange as it may appear, were those of my cases who succumbed during the first year of the disease. The cause of death in 87 per cent. of these was coma. But diabetes is a chronic disease and the first year of its course should be mild rather than severe, and in mild diabetes coma should find no place.

Just as the health officials of a city, zealous to lower its death rate, concentrate their efforts on those sections of the city with the highest mortality, so should we, in the treatment of diabetes, concentrate our efforts where mortality is also greatest—on the children and on those patients who have recently developed the disease. To-night attention will be directed upon the treatment following immediately upon the detection of the disease, for this is where the highest mortality in diabetes now exists.

Reference has just been made to a mortality of 87 per cent. from coma among diabetics who die during the first year of the disease. Is the term "first year of the disease" quite accurate? It is meant to be accurate. I have most conscientiously tried to fix a definite date for the onset of diabetes in all of my cases. But honestly would it not be more truthful to say the first year of the recognition of the disease? And herein lies a vast difference which gives rise to serious reflection, for it is in the first year of the *recognition* of the disease that treatment is begun, and the highest mortality occurs. Disagreeable as such an implication is to hear, some support for it is afforded by the fact that with the increase in the knowledge of the treatment of diabetes, the mortality for the first year of the disease has decreased. It is significant that whereas between the years 1824-1898, of those cases of diabetes dying at the Massachusetts General Hospital, the duration of the disease was under one year in 68 per cent., for the subsequent fifteen years ending November, 1913, Dr. Brigham and I are able to say, thanks to the courtesy of the hospital authorities, that the mortality during the first year of the disease had fallen to 41 per cent. My friend Professor Naunyn, whom all of you will recognize as a master of diabetes, though his cases must have been treated during a generation previous to ten years ago, showed a mortality of only 28·2 per cent., which was the same, as far as I can determine, for the city of Boston for 1915. The period of my own activity has been later, and so more favourable; perhaps my cases have been less severe, and this may explain first, why but 17 per cent. of my own cases

have died during the first year of the disease, and second, the more encouraging feature that 95 per cent. of those living have already gone beyond this period. In fact, my own experience is against the idea that properly treated diabetes runs an acute course. Such figures, while they afford reason for gratification at the improvement in treatment, also furnish proof that the high mortality in the first year is unnecessary, and in what follows will be indicated how the development of acid poisoning during this period may be avoided and how to conquer it before coma results.

The prophylactic and etiological treatment of diabetes will surely play an important rôle in the future, and it is already plain that progress will be along two lines; first, towards the early detection of the disease in those susceptible to it. The whole trend of Naunyn's teaching favours the energetic treatment of the slightest evidence of diabetes. The importance of the early treatment of pulmonary tuberculosis is not greater than that of the early treatment of diabetes.

The only way in which an early diagnosis of diabetes will ever be made is to search for it. The favourable results in fifty-seven of my cases of diabetes revealed by life insurance examinations cannot be explained by the mildness of the diabetes discovered. It is a hopeful sign that the insurance companies are offering to examine the urines of their policy holders gratis at frequent intervals. Everyone should have the urine examined upon his birthday.

Diabetes should be sought in the families of diabetic patients and in order to allay anxiety from urinary examinations, it is a good plan to have these made with such frequency that they will become simply a matter of routine. Such individuals should be taught to regulate the quantity of food eaten by the body weight, and never to indulge in unusual quantities of carbohydrate.

No preëxistent abnormal condition has occurred more frequently among my diabetic patients than has obesity, and it affords a splendid opportunity for the physician in which to practise preventive medicine. Patients should be cautioned against suddenly gaining weight at any period, but particularly after infectious diseases. The development of diabetes following infectious diseases and in the course of pregnancy always should be borne in mind. Finally, anything which tends to promote the mental and physical welfare of the patients will tend to prevent the onset of diabetes.

Surgery may find a field for treatment in the future more than it has in the past. I recall eight cases of diabetes associated with gall stones which ran an unusually favourable course so soon as

the symptoms of the gall stones had subsided, either as a result of medical or of surgical treatment.

That temporary periods of under-nutrition are helpful in the treatment of diabetes will probably be acknowledged by all after these two years of experience with fasting. In no other way can one so readily keep the urine free from sugar and this is the foundation of all diabetic treatment. With a sugar-free urine there is seldom any opportunity for coma. The inauguration of the treatment and the prolonged continuance of the same are problems which present the most difficulty. Practically the only danger associated with the former is the possibility of acid poisoning at the beginning of the fast, though it can be emphatically stated that it is the rule for acid poisoning to decrease rather than to increase as the fast continues. But on account of the few cases where it does increase it is safer to prevent acidosis than to allow it to develop. This is the reason for what might be called a preparatory treatment for fasting, for it can be assumed that a method of treatment which approaches or embraces fasting is the best method we possess. It is a sound rule of all treatment that patients coming to the physician in an endurable state must not be made worse or have their lives jeopardized by the therapeutic procedures adopted.

Treatment is simplified, if acidosis is prevented, because no urinary tests will, as a rule, be required save a qualitative test for sugar and the simple ferric chloride reaction for di-acetic acid. Such simplification of methods is necessary when we realize that most physicians do not have more than five or ten cases of diabetes a year and therefore cannot devote to these a proportionately large share of their time.

Individuals predisposed to acidosis are those in whom the disease is of long duration. These are the patients who, after having lived in a fairly comfortable condition for years, finally succumb to active treatment within a few days of its commencement. All complicated cases, especially those in which the complication involves the kidneys, heart or thyroid, demand preparatory treatment, for they are especially susceptible to acidosis. In this group are also included elderly patients, because of their vulnerable kidneys. Very fat diabetics could appropriately be included, and so too, patients about to undergo surgical operations. Finally, all patients showing signs of acid poisoning demand this preparatory treatment before the fast, unless the physician is in a position to watch quantitative changes in the acidosis from day to day.

The principle upon which preparatory treatment is based is

simplicity itself—the exclusion of the source of the acid poisoning. Since the chief source of acid poisoning is fat, this constituent of the diet is prohibited before any further change is made. If this rule is adopted, the opportunity for the patient to develop acid poisoning is greatly reduced, and for two reasons: first, the chief source of acid bodies is removed, and no fat is then available for the formation of acid bodies except the fat of the body; second, in consequence of the partial fast, which is thereby initiated, the possibility of oxidation of some of the carbohydrate which the patient is eating is afforded, and if this should fortunately take place, acidosis is sure to decrease. So strongly have I been impressed by the stormy career of the diabetic patients in whose diet carbohydrates have been suddenly restricted and fat increased, in contrast to the placid course which those pursue from whose diet fat has been excluded and the carbohydrates left unchanged, that whenever I am asked to see a new case of diabetes I beg the physician either not to change the diet at all, or simply to omit the fat until the consultation takes place, and when the patient actually comes for treatment I first omit all the fat in the diet, after two days the protein as well, and then halve the carbohydrate on successive days until 10 grams are reached unless the patient is already sugar-free, and thereafter fast.

The days of preparation for the fasting are also advantageous in that they allow opportunity to examine into the general condition of the patient. It would be absurd to feed a patient without teeth with course vegetables, or to give these to another patient who has diarrhœa. The bowels must be thoroughly opened, but I do not believe in free catharsis. Gain enough is obtained if a movement is produced once in twenty-four hours when it has only been taking place once in three days. In other words, do not upset any patient who is in a tolerable state. Furthermore, allow the patient to continue his regular routine, avoiding excess in any direction. Remember what happens to an old man who is suddenly confined to bed, and the discomfort which follows confinement following a fracture. Do not force a temperate man to drink against his will.

An advantage which the omission of fat from the diet affords is the rest which is given to the digestive tract. Former treatment, which increased the fat in the diet, was the converse of this, and frequently led to vomiting, with the result that patients on the verge of coma fell into it. In every way seek to prevent worry on the patient's part, and from the start give them to understand that they are at school rather than at a hospital.

After the preliminary measures have been taken to prevent the appearance of acidosis one may proceed with fasting. Fasting is never so rigourous as doctors or patients expect. Patients are more ready to undergo it than physicians to prescribe it. Quite as often it is as much a relief to the patient as it is a discomfort. This is in part due to the gradual decrease in polydipsia and polyuria. Headache occurs less frequently than I expected, and is usually dispelled by a cup of coffee. Nausea almost never occurs unless a patient is given alkali or alcohol. Children bear it more easily than adults. Case No. 899 with onset at eighty-three shunned it and rightly, but she became sugar-free and her family, at first reluctantly, but now emphatically, agree, with distinct benefit. In fact, it is always desirable to avoid fasting in the old, and this can ordinarily be accomplished by the help of preparatory treatment because the simple omission of fat and reduction of protein and carbohydrate will usually suffice to make the urine sugar-free.

Fasting does not seem like fasting to the patients when they receive coffee, tea, cracked cocoa and broths, and are given an unlimited supply of water. If the quantity of urine, as it often does, falls to less than normal, the patients are urged to drink water freely. Clear meat broths are a great satisfaction. Contrary to my experience with digestive cases, broths do not stimulate the appetite in fasting diabetics; they relieve it. The advantage of broths is probably due in part to this, but to a considerable extent to the patient receiving salt by which he may maintain the equilibrium of the body fluid. It is possible that the salt is a more important factor in the treatment than has been supposed.

Patients should not be kept abed during fasting, neither should they be forced to be up all day. They should be afforded diversion by visits from friends, walking short distances, easy handiwork, playing games, letter writing and reading. In general they are glad to rest for the greater part of the first day of the fast, but upon each succeeding day I have noticed that they are desirious to increase the amount of exercise, and the exercise appears to lessen the necessity for a prolonged fast. Case No. 765, a trained diabetic, who returned to the hospital in order to become sugar and acid-free, at the end of three and one-half days of fasting, enjoyed, without fatigue, going to the theatre. I confess this was not with my advice, for I have endeavoured to prevent exposure to any infectious disease of all diabetic patients during fasting. However, Case No. 938, a child of two and a half years, underwent fasting

treatment successfully in the presence of a mild infection of the upper air passages.

It is surprising how variable is the period required to render the urine sugar-free. Frequently a urine which contains 7 per cent. of sugar becomes sugar-free after four meals of fasting, and conversely a urine with only 3 per cent. of sugar may still retain traces after the patient has been deprived of food for three or four days. In general cases seen soon after onset become sugar-free promptly, whereas the reverse is generally true for those of long duration. Children showing large quantities of sugar have also become sugar-free very promptly when the duration has been only a few weeks. I have a suspicion that cases of long standing will actually become sugar-free more quickly if they undergo preparatory treatment than if they are fasted immediately. This may be due to the avoidance of even a slight acidosis. Even a slight acidosis must be conquered.

The observation of Folin and Denis that an obese individual, though otherwise normal, developed marked acidosis upon fasting but went through a second period of fasting with less acidosis than the first, and the practice, observed by many clinicians of the old school, who advantageously fasted their diabetics one day a week, have given the cue to intermittent fasting.

For a good many months none of my patients have been subjected to a fast of more than four days. A prolonged fast is unnecessary, and even if the fast is carried out, it is doubtful if the patient would always become sugar-free. The apparent reason for the persistence of sugar in Case No. 610, who fasted for nine days, was the presence of a vulval abscess, and inquiry among my friends shows that an infection of some kind is usually present when glycosuria persists after a fast of a few days' duration. This is not always the case, for the difficulty in rendering the urine sugar-free may be due simply to the extreme severity of the disease.

Alternate feeding and fasting are adopted when it is found that the glycosuria persists after a preliminary four days' fast. The method which I have found most successful has been to allow, following the first fasting period, 20 to 40 grams carbohydrate—not far from half a gram per kilogram body weight—and about one gram of protein per kilogram for two days. The sugar promptly increases in the urine, but if one averages the excretion of sugar in the urine of these two days with the two days at the beginning of the fast, the result is encouraging. Then fast again; but the second fast is a day shorter than the first, and the second period of feeding

a day longer, until by the fourth period of fasting the patient goes without food only one day and then is given food for four days. This schedule need not be followed exactly, but the general plan has proved most efficacious.

When the 24-hour quantity of urine is sugar-free one can usually give a few grams of carbohydrate to the patient without the appearance of glycosuria. The carbohydrate is generally given in the form of 5 per cent. vegetables, choosing those which are especially bulky. A plateful of lettuce appeals much more to the patient than a small saucer of string beans. When a mixture of 5 per cent. vegetables is given one can be quite sure that the average content of carbohydrate is not more than 3 per cent., or approximately $4\frac{1}{2}$ grams for the 150 grams prescribed, and for convenience sake this is reckoned as one gram of carbohydrate for each 30 grams (one ounce). This small amount of food, of course, has little nutritive value, but is enough to break the fast. Upon succeeding days 5 or 10 grams of carbohydrate are added daily. A patient fasting or on a very low diet often shows an apparent tolerance for carbohydrate far in excess of that which he would have shown if the necessary protein and fat in his diet were simultaneously administered.

Following the trial with 5 per cent. vegetables the addition of carbohydrate can be made according to the desire of the patient until the tolerance is determined.

With children one often makes the mistake of increasing the carbohydrate 5 grams daily, forgetting the fact that 5 grams of carbohydrate to a child weighing 20 kilograms is in the same proportion as 15 grams of carbohydrate to an individual of 60 kilograms.

Patients who have lived for a considerable length of time on a comparatively low tolerance for carbohydrate may upon trial show that the real carbohydrate tolerance is much greater than supposed. The most striking example in my series has been the patient already referred to—No. 610, who fasted for nine days without becoming sugar-free. During the last twelve months she has lived comfortably but the quantity of carbohydrate in the diet has been represented by 60 c.c. of cream (2 grams) for all her vegetables have been thrice washed. Despire this rigid diet sugar kept recurring every few days but she persisted to drive it out by fasting. Recently upon reëntrance to the hospital she became sugar-free overnight, and thereafter the steady addition of 10 grams of carbohydrate a day in the form of vegetables up to 55 grams,

failed to cause glycosuria, to the surprise of us all. At length, as a test, she drank 55 grams of lævulose and even then the urine remained sugar-free. At this time the protein in the diet was represented only by that contained in the vegetables. Thereafter it was gradually increased, and along with it a little fat, so that finally, at the end of ten days following her readmission to the hospital, she was taking 55 grams of carbohydrate, a gram of protein per kilo, and at this writing sufficient fat to be equivalent to about 25 calories per kilogram body weight. Contast this picture with that of a year ago when it was necessary for her to fast nine days to make the urine sugar-free and when a diet in excess of 2 grams of carbohydrate led to the appearance of sugar in the urine. This very recent experience has given renewed hope to my patients who have been watching its development, and to me. It is a fresh demonstration of the efficacy of energetic treatment.

As a rule when the urine has been sugar-free for two days, 20 grams of protein are added to the diet, and thereafter 15 grams of protein daily until the patient is receiving 1 gram per kilogram body weight. The protein may be given either in the form of eggs, lean meat or fish; an egg of average size contains approximately 8 grams of protein and 30 grams (1 ounce) of lean meat contain approximately 8 grams. By this arrangement a patient weighing 60 kilograms would be taking, within six days from the time he became sugar-free, 1 gram of protein per kilogram body weight. This quantity is quite satisfying to all except children—in fact, it astonishes me to find how few patients care to take as much as a gram and a half of protein per kilo body weight. Children, however, crave and need considerably more, and indeed take with avidity as much as 2 or 3 grams protein per kilogram body weight.

Fish is especially desirable in the early days of protein feeding because it contains so little fat. Cod and haddock, for example, contain less than 1 per cent.

The advantage of giving and increasing protein simultaneously with the determination of the carbohydrate tolerance is that one approaches more nearly normal conditions. What the physician is after is to determine the carbohydrate tolerance while the patient is on a full diet, and not the tolerance for carbohydrate alone, but it is possible that one should defer the addition of protein a few days longer if the carbohydrate can be steadily increased without the appearance of sugar.

There are very few patients who will not bear at the outset as much as 1 gram of protein per kilogram body weight, and I am

very loath to allow the protein to remain permanently below this figure. This can be avoided by still further restricting the carbohydrate, either temporarily or permanently. It is always necessary to bear in mind that one food which the diabetic patient cannot do without is protein, and to it everything else must be subservient.

While testing the protein tolerance, a small quantity of fat is included in the eggs and meat given. It is not at all disadvantageous—in fact, the same rule holds for the testing of the carbohydrate and protein tolerance in the presence of fat as has been said for protein alone. There are two important reasons why fat is not given to the diabetic immediately upon his becoming sugar-free: first, by the omission of fat partial fasting is continued and thereby the patient is gaining a tolerance for carbohydrate, and second, the continued omission of fat is beneficial in counteracting the last vestige of acid poisoning, or preventing the appearance of acid poisoning, which easily might occur in a diabetic patient whose metabolism has not become accustomed to so low a quantity of carbohydrate. But so soon as the patient has received the essential gram protein per kilogram body weight, the fat in the diet should be increased above the 15 to 20 grams which undoubtedly are introduced with the protein ration. If the patient is one in whom acidosis has been an essential factor, or if the patient is obese, the fat should be increased slowly, and for such a patient an increase of 5 to 10 grams a day may be all that he can take without the recurrence of a positive ferric chloride reaction in the urine. On the other hand, attention is called to Case No. 765, who, after persistent periods of intermittent fasting, became sugar and acid-free, and yet the immediate addition of 30 grams fat per day failed to cause the reappearance of acidosis. Cases which have shown little acidosis may easily be allowed an increase of 25 grams fat faily, and for such cases this is desirable, because it rapidly brings the total caloric value of the diet up to a normal figure. Naturally, patients in whose treatment a loss of weight is desired would be given smaller quantities of fat.

The total number of calories which a diabetic requires varies not only with each case, but varies with each case each day. Schematic rules do not hold. One must remember that an individual trained to be quiet and lying down can get along with only 20 calories per kilogram body weight reckoned per twenty-four hours, whereas the average of a large group of normal men and women, not especially trained for the test at the Carnegie Laboratory, consumed 25 calories per kilogram body weight reckoned also

per twenty-four hours. Habits of individuals vary widely. Some are quiet and some are active. All these considerations should be clearly borne in mind by doctors and patients in order not to allow themselves to be held too rigidly by any caloric fetish. Patients coming for treatment with severe acidosis consume from 10 per cent. to 20 per cent. more calories per kilogram body weight than patients after they have become sugar-free and free from acid.

After the diabetic has become sugar and acid-free, he apparently gets along, as Naunyn long ago pointed out, with a smaller amount of food than an ordinary individual. This may be so. From a study of dietary charts in diabetes it appears probable, but I do not believe the question yet settled. Before this can be done, studies should be made upon cases of diabetes of the severest type who have become sugar and acid-free, and remained so for a period of weeks. The caloric values of their diets should then be quantitatively determined. Ordinary calculations, based on dietary tables, will not suffice. Actual analyses of the diets of a group of such patients for a period of several weeks should be made. This is by no means an impracticable matter, and I think the accomplishment of it would be of the greatest help to diabetic patients and would settle many mooted points.

Should the calories be raised above a minimum portion in severe cases of diabetes, glycosuria will return. Therefore great care must be taken to prevent over-eating and undue gain of weight.

The return of sugar demands fasting for twenty-four hours, or until sugar-free. This rule should be inflexibly followed, especially with children. In hospital it simplifies the treatment enormously. So soon as it is understood that the reappearance of sugar means a fast for twenty-four hours thereafter, there is little tendency to break over the diet. Furthermore, most patients are thrifty enough to see the disadvantage of paying their board with no return. The rule must be rigidly enforced with children, because with them disobedience means death. When a patient has been made sugar-free by a preliminary fast, starvation for twenty-four hours will almost invariably be sufficient to free the urine at once if the sugar returns. This will not be the case unless the presence of glucose is promptly detected, and hence the necessity for the patient's examining his twenty-four hour urine daily. Following this accessory fasting day, the previous diet of the patient may at once be resumed except for the elimination of half of the carbohydrate, or the original course of treatment may be followed, except passing through the different stages at a more rapid rate.

The advantage which the older clinician derived from the use of one day's fast in seven in the treatment of his diabetic patients should ever be borne in mind. One striking characteristic of Dr. Allen's helpful suggestions in the treatment of diabetes (and I cannot say more than I already have said elsewhere of my high appreciation of his work) has been that he has apparently sought out every method which anyone has found useful in the treatment of diabetes, tested its worth, and endeavoured to adapt it to modern conditions.

The mild case of diabetes is the case which demands the most energetic treatment, but hitherto has received the least. These cases are analogous to the cases of incipient tuberculosis. As in tuberculosis, a cure may not be effected, but the disease is held in check. Emphasis should be placed on freedom from glycosuria. Naunyn's dictum that many a severe case was originally mild, but neglected, should not be forgotten. It may not be necessary for such patients to practise fasting. In our enthusiasm for new methods it should not be forgotten that even in the past good results were obtained with many diabetics, and that gradual restriction of carbohydrate and the total diet was the means e nployed. Incidentally, this is good proof that most diabetics are not severe.

It would be wrong to give the impression that the treatment of severe diabetes is simple and free from anxiety. It is true that it is much easier and causes infinitely less worry to the physician than heretofore, but these patients are in most unstable equilibrium and a little upset of trivial character may lead to much danger. The physician who treats severe diabetes successfully must constantly be in close touch with his patient. Forewarned, forearmed! I like to have at least a glance at a severe case of diabetes two, three or four times a day, and the amount of information furnished by the laboratory is never too great.*

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* This paper was prepared simultaneously with the text of a book of similar title now being published for the author by Messrs. Lee & Febiger.

THE COLLOIDAL GOLD TEST IN CEREBRO SPINAL FLUIDS

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AND

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THE object of this article is to state our experiences and conclusions with the title subject. While further work leading out of this study has been interrupted, it has seemed advisable to give such results as we have obtained.

The published work upon this test is for the most part favourable, but the earlier hopes that it would serve to detect different types of syphilis of the central nervous system and different types of meningitis are not being realized.

In the following table is summarized the results of the examination of one hundred and eight specimens of spinal fluid. The cases are grouped according to the clinical diagnosis. No other tests have been made to parallel the colloidal gold test throughout the series, but the Wassermann test has been made in over 60 per cent. of the cases and has been noted. In the tabulation of our results we have expressed the curve of colour change after the manner of Lee and Hinton[2] thus: No change=0; slight change=1; red blue=2; violet=3; blue water=4; water clear (complete precipitation)=5. In this way the result appears as a series of ten numbers representing the degree of colour change in the ten tubes of the test, beginning with the 1:10 dilution and ending with the 1:5120 dilution. In the larger groups of cases to avoid listing a long series of numbers, we have determined roughly what might be termed an average and a mode formula, the former representing the approximate average change of colour in each tube, and the latter the series of colour changes to which the majority of the cases conform.

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Clinical Diagnosis	No. of Cases	Wassermann Test			Reading of Individual Cases	Average Reading of Group	Mode	Remarks
		Pos.	Neg.	Unknown				
General Paresis.....	25	20	..	5	.....	4445444321	5555554320	
Cerebro-spinal Syphilis.....	2	1	..	..	0112332100	.....	.....	
		1	..	..	0045555555	.....	.....	No autopsies.
Epilepsy.....	43	0	25	..	.....	1111111111	0111000000	
		..	..	18	.....	1111000000	0000000000	
Meningitis.....		..	1	..	0000000444	.....	.....	(Streptococcus mucosus)
		..	..	1	0000012343	.....	.....	B. tuberculosis.
		..	..	1	0000000345	.....	.....	Streptococcus.
		..	..	1	0001113443	.....	.....	Pneumococcus.
		..	..	1	0000002554	.....	.....	Meningococcus.
		..	..	1	0000000442	.....	.....	"
		..	..	1	0000003331	.....	.....	"
		..	..	1	0000000455	.....	.....	"
		..	..	1	0000244211	.....	.....	"
		..	..	1	0000033542	.....	.....	
All forms.....	10	..	..	..	.....	0000012443	0000000444	
Meningismus.....	3	..	..	..	.....	0000000000	0000000000	

Clinical Diagnosis	No. of Cases	Wassermann Test			Reading of Individual Cases	Average Reading of Group	Mode	Remarks
		Pos.	Neg.	Unknown				
Brain tumour.....	3	..	..	1	0000000000	.....	.....	No autopsy.
		..	1	..	0001100000	.....	.....	No autopsy.
		..	1	..	0014421000	.....	.....	Endothelioma.
Huntingdon's Chorea	2	..	..	1	1233220000	.....	.....	
		..	1	..	2234300000	.....	.....	
Manic, Depressive.....	5	..	..	1	0000000000	.....	.....	
		..	..	1	0000000000	.....	.....	
		..	1	..	0000000000	.....	.....	
		..	..	1	0000000000	.....	.....	
		..	..	1	1221100000	.....	.....	
Dementia Præcox.....	5	..	..	1	0000000000	.....	.....	
		..	1	..	0021110000	.....	.....	
		..	1	..	0000000000	.....	.....	
		1	..	..	1100000000	.....	.....	Under treatment.
		..	1	..	0000000000	.....	.....	
Unknown.....	10	..	10	..	.....	0111100000	0001100000	

The cases of general paresis were typical with the exception of one in which the clinical course suggested a possible dementia præcox plus a syphilitic infection. The spinal fluid, however, showed increased cells, increase of globulin, a typical curve with colloidal gold, and a strongly positive Wassermann. The curve for paresis was quite uniform in all cases except two in which the depth of colour change reached only to the point three. This occurred in the fourth tube in the one case and the fourth and fifth in the other.

The two cases diagnosed clinically as cerebro-spinal syphilis did not come to autopsy. The curves are distinctly different. From our experience with other fluids we do not believe that a curve for cerebro-spinal syphilis exists which can be distinguished from curves obtained with some non-syphilitic conditions, as for instance the case of endothelioma of the brain.

In five cases of epilepsy change of colour to the point three occurred. In two cases change of colour reached four, and in two others five. In all of these the Wassermann was negative. The curves may perhaps be accounted for by some admixture of blood serum, for further investigation of epileptics showed their spinal fluids to be practically inactive and they failed to give any characteristic curve. Also we have concluded in agreement with Swalm and Mann[6] that slight grades of colour change are not significant.

The curve in two cases of Huntingdon's chorea is interesting in being approximately the same, but no conclusions can be drawn.

Of the cases diagnosed as brain tumour only one came to autopsy and this was a case in which a suggestion of gumma was made from the colloidal gold test and the occurrence of a doubtful Wassermann in the blood serum. Later, however, a negative Wassermann was obtained in blood and spinal fluid and the post-mortem examination showed a large endothelioma.

The group of cases of meningitis is interesting as showing agreement in the position of maximum colour change in the end zone in spite of a variety of infective agents. There is even more agreement here than in the group of five cases of tuberculous meningitis mentioned by Grulee and Moody.[4] It should be pointed out that in any form of acute meningitis with the location of the bacterial irritant upon the brain coverings, there will be added to the normal cerebro-spinal fluid in varying quantities the elements of an inflammatory exudate which in its fluid part will consist largely of the constituents of blood serum.

We have found that if spinal fluids which show no change with

colloidal gold have added to them varying proportions of blood serum before the test is set up, such mixtures will give reactions which are practically identical with those obtained in suppurative or tuberculous meningitis. When one tenth or more serum is present the height of colour change usually occurs in the last four dilutions of the series. Decreasing the proportion of serum tends to cause the maximum point of colour change to travel towards the left so that curves occur in the mid zone though the degree of change may not be as great.

This suggests that quantitative differences in the exudate in the spinal canal will produce different curves with colloidal gold and may offer some explanation of Grulee and Moody's findings. It also demonstrates the importance of having fluids uncontaminated by even minute quantities of blood serum, and also casts some doubt on the value of midzonal curves. It is doubtful too, if end zone precipitation should be accounted of any value in the diagnosis of meningitis if unaccompanied by an increase of cells.

In the group marked "meningismus?" one case was typhoid fever, but the other two may have been abortive types of epidemic meningitis for there was an increase of cells but no definite increase of globulin and the patients recovered, one without any further puncturing and the other after receiving a dose of antimeningitis serum at the time of the first puncture, and only one other puncture thereafter.

A group of cases is listed where the clinical diagnosis was not obtained but in which the Wassermann reactions were negative. No precipitation occurred in the luetic zone with any of these cases. The constancy of the curve in general paresis has suggested that the substance responsible for the precipitation of the colloidal gold may be the same as that constituent of blood and spinal fluid which accounts for a positive Wassermann reaction. Recently, however, Weston[8] has concluded that the substances concerned are not identical.

Repetition of the experiments with mixtures of blood serum and spinal fluid and repeated tests on the same fluid with different indicators has disclosed the fact that there is sometimes a distinct variation in the sensitiveness of the colloidal gold solutions even when made by the same method. We also tried solutions made by the use of a small crystal of pyrogallic acid in place of the formaldehyde solution. These indicators although of a beautiful ruby colour were sometimes such comparatively stable colloids

as to be unaffected by the fluid of a typical paretic or by salt solutions of considerable strength.

Colloidal solutions are said to vary according to the electrification, size and number of their particles. In the case of the gold solution the electrification does not alter in quality but certainly by different methods of preparation it can be shown that the number and size of the particle will vary to such a degree that some solutions will precipitate where others will remain quite inactive with the same and even larger quantities of protein or electrolyte. That variations occur in the precipitability of colloidal gold solutions made by the formaldehyde method we believe to be not infrequent, and hence differences in curves with fluids from the same type of case may result not from quantitative differences in the fluids but from qualitative differences in the indicators. It is quite evident that in the Lange test the preparation of the gold solution by the formaldehyde method must be adhered to, but it may be advisable to test every indicator for its sensitiveness either by the use of a known paretic fluid or possibly by titration with an electrolyte. We have endeavoured to arrive at a colloidal gold solution of definite sensitiveness by setting up a series of ten tubes containing chemically normal NaCl from ·05 c.c. to .5 c.c. making up to constant volume and then adding 5 c.c. of indicator. It would seem to us unwise to use an indicator which will not precipitate in at least the last five tubes of such a series.

Our conclusions concerning this test at the present stage of our experience with it we may summarize thus:

1. The colloidal gold test in cerebro-spinal fluid forms a valuable confirmatory test for general paresis.
2. No constant curve of precipitation occurs in epilepsy.
3. A very small admixture of blood serum will render results unreliable.
4. No special significance can be attached to curves with the maximum of precipitation in the mid zone.
5. Slight degrees of colour change are not significant.
6. Maximum precipitation in the end zone occurs in most cases of acute meningitis but there is no definite relation to the causative organism.

7. Each indicator should be tested for its sentitiveness before use.

References:

1. Grulee and Moody, *J.A.M.A.*, July 5th, 1913.
2. Lee and Hinton, *Am. J. Medical Sciences*, July, 1914.
3. Solomon and Koefod, *Boston Med. and Surg. J.*, December 10th, 1914. (Abstract *J.A.M.A.*, January 2nd, 1915.)
4. Grulee and Moody, *Am. J. Diseases of Children*, January, 1915. (Abstract *J.A.M.A.*, January 23rd, 1915.)
5. Solomon and Welles, *Boston Med. and Surg. J.*, March 18th, 1915. (Abstract *J.A.M.A.*, April 3rd, 1915.)
6. Swalm and Mann, *New York Med. Journ.*, April 10th, 1915. (Abstract *J.A.M.A.*, May 1st, 1915.)
7. Weston, Darling and Newcomb, *Am. J. Insanity*, April, 1915. (Abstract *J.A.M.A.*, June 5th, 1915.)
8. Weston, *Journal Medical Research*, March, 1916.

The Miramichi Hospital at Newcastle, New Brunswick, was formally opened on July 1st. The hospital is the gift of Mr. Ernest Hutchison. The building is of native sandstone and overlooks the Miramichi River; it has a frontage of 144 feet, with an average depth of 40 feet, and is equipped with every modern convenience including an *x*-ray room, an electric elevator, and laundry. The cost of maintenance will be borne by public subscription and endowments amounting to about $6,000 have already been made. Accommodation is provided for from forty to fifty patients.

MEDICAL WORK AT A BASE HOSPITAL IN FRANCE

By F. G. Finley, M.D.,

Lieutenant-Colonel C.A.M.C.

DURING the past winter a considerable number of medical cases were treated at the Base hospitals in France. The ratio of sick, however, to the vast numbers engaged in the British forces was extremely small; serious illness played an unimportant rôle, a large proportion of the cases being of a comparatively trivial character.

Influenza was prevalent during the winter and spring months, the disease running a febrile course of from three to seven days. The abrupt onset with catarrhal symptoms, violent frontal headache, severe pains in the back and limbs and often profuse perspirations recalled the character of the disease as seen in civil practice; vomiting and diarrhœa were only exceptionally present, whilst convalescence was not associated with that degree of weakness and prostration which is such a marked characteristic of this malady.

A mild type of bronchitis was frequently seen. No cases were observed of the extremely severe and sometimes fatal purulent bronchitis seen during the previous winter in both England and France.

Although predictions as to the probable frequent occurrence of pneumonia were freely made, these have proved as false as most of the predictions relating to the war. Very few cases of lobar pneumonia occurred during the winter, the number increasing during the spring months. Broncho-pneumonia on the other hand was of more frequent occurrence and a considerable number of cases developed in wounded men, in whom lowered resistance from hæmorrhage or infected wounds, infection from the prevalent tracheitis and bronchitis, and as a result of ether anæsthesia, may perhaps be regarded as determining causes. Pulmonary tuberculosis and pleurisy with effusion formed an appreciable but small proportion of sick cases.

Articular rheumatism, so long regarded as due to cold and wet, also proved to be quite exceptional, certainly much rarer than in civil practice.

Under the term of myalgia great numbers of men were admitted with varying degrees of pains in muscles and bones. The frequency and duration of this class of case rendered it important as a cause of disability. The clinical manifestations of many of these cases consisted in severe pain in the back, thighs, and legs, often described as of agonising intensity and so severe at night as to prevent sleep. There was often a history of a febrile onset and headache, and although the usual course was afebrile, there were often repeated short periods of fever, and objectively in some instances enlarged spleen. The mode of onset and the splenic enlargement suggest an infection. Some of the cases had an onset precisely like influenza, including catarrhal symptoms, but with an unusual continuance of the limb pains. Others again were probably examples of French fever. Captain G. A. Brown, of No 3 General Hospital, described a class of cases of "French shins", accompanied by intense pain in the shins and a mononuclear increase of leucocytes, a sign probably indicating bone infection. The duration of many of these myalgic conditions was prolonged, lasting for several weeks. Treatment seemed to have but little influence on the duration of the malady or on the severity of the pains. Opiates alone had a decided action in alleviating pain, whilst iodides, salicylates, coal tar drugs, heat, cold and baking were of little value.

Acute nephritis was one of the most striking diseases met with. The large number of cases was very suggestive of an infective origin. Although the cases increased in winter yet very few occurred during the first winter of the war, indicating that cold and exposure alone could not be the actual cause, and that some more obscure origin was operative. Clinically the cases began suddenly with chilly sensations, headaches, œdema and dyspnœa. This last symptom was a very constant feature, coming on not only during exertion, but occurring in paroxysms especially at night. The urine presented a large amount of albumen and numerous granular, hyaline and epithelial casts, whilst blood was almost invariably present microscopically and in some cases tinged the urine to a brown or even red colour. Whilst the œdema and dyspnœa passed off in the course of a week or two, albuminuria was more persistent. The blood pressure was often raised from 150 mm. to over 200 mm. Although complete recovery ensued in a number of cases, there will doubtless be a considerable residue of cases passing on to a chronic condition.

Perhaps the greatest triumph of the Royal Army Medical

Corps has been the control and practically the abolition of typhoid. This result is due to preventive inoculation and to careful sanitary precautions. Laboratory examinations are carred out for carriers and when positive the individual is isolated. Para-typhoid is more prevalent than the genuine disease, the cases running as a rule a shorter and milder course that true typhoid.

Tetanus has also been controlled by preventive doses of antitoxin. Unfortunately the period of immunity is short and a second dose is necessary in all prolonged cases of suppurating wounds. In one hospital a small epidemic was immediately checked by the routine administration of antitoxin to all wounded men, care being taken to administer a small preliminary dose to prevent anaphylactic shock.

The fourth annual convention of the Cremation Association of America will be held in the auditorium of the Hotel Gibson, Cincinnati, on the 24th and 25th of this month.

The annual meeting of the American Medical Editors' Association will take place at the McAlpin Hotel, New York, on October 25th and 26th, next, under the presidency of Dr. Edward C. Register, editor of the *Charlotte Medical Journal.* The meeting will be devoted exclusively to problems of a journalistic nature and an interesting programme has been prepared.

MENINGOCOCCUS MENINGITIS

By J. G. Fitzgerald

Associate Professor of Hygiene, and Director of the Antitoxin Laboratory, University of Toronto

MENINGOCOCCUS meningitis, cerebro-spinal fever or cerebro-spinal meningitis has been recognizable as a distinct entity since Weichselbaum[1] published the result of his study of six cases of the disease in which the clinical and bacteriological findings were for the first time fully correlated.

Pathological conditions involving the meninges of the brain and spinal cord were known long before the appearance of the above communication in 1887; but this served the purpose of stimulating further investigation of the meningitides, particularly when the disease process presented epidemic features. The classical study of Councilman, Mallory and Wright[2] of the outbreak of meningitis in Boston in 1896, well illustrates this. It is a curious fact, that, until recently (the outbreak in Greece in 1911 being the most noticeable exception) the most severe epidemics have occurred in America, despite the fact that the first outbreak of the disease in epidemic form, was reported from Geneva in 1805 by Vieusseaux. France and Denmark, Sweden, Germany, and Ireland, however, all suffered in the hundred years between 1805 and 1905. Nevertheless, the greatest ravages of the disease have been observed in North America, as illustrated by the recent epidemics in New York City and in Texas.

It is not the purpose of the present writer to review the facts regarding the varieties of meningitis due to *B. tuberculosis*, the pneumococcus, streptococcus, *B. typhosus*, *B. influenzæ* or allied microörganisms, the object of this paper being simply a study of the principal features of ninety-five cases of meningococcus meningitis, the histories of which have been accessible. In addition, certain bacteriological data have been obtained as a result of personal investigation.

The subject has recently taken on added interest for several reasons. Firstly, it has long been known that the concentration of

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large numbers of men in barracks under conditions necessitated by military exigencies has favoured outbreaks of epidemics of meningococcus meningitis. Ontario has had an example of this during the past year and a half. In the second place after being accepted as the etiological agent in epidemic cerebro-spinal meningitis for thirty years, the rôle of the *Micrococcus intracellularis meningitidis* of Weichselbaum in this disease, has recently been challenged.

Hort[3] and his collaborators in three recent publications have maintained that the meningococcus has not been proven to their satisfaction to be the "primary infective agent" in epidemic cerebro-spinal fever. As a result of bacteriological investigation and animal experimentation it is suggested that the true etiological factor is a so-called "filter-passer" or filtrable organism, the exact nature of which has yet to be determined. The evidence adduced by Hort and his co-workers when examined by the Special Advisory Committee upon Bacteriological Studies of Cerebro-Spinal Fever during the epidemic of 1915, consisting of Andrewes, Bulloch and Hewlett (appointed by the Medical Research Committee under the National Health Insurance Act) is commented upon as follows in their report[4]: "We find such views (as those of Hort) far from convincing and they are at variance with the experiences of the overwhelming majority of bacteriologists who have studied this disease." Since the above report was published Hort's third paper has appeared. In addition Caulfeild[5] who has recently been associated with Hort, in two personal communications to the writer, claims to have proven in monkeys that (a) the filtrates, of cerebro-spinal fluid from cases of meningococcus meningitis after passage through Chamberland filters, are definely pathogenic for these animals, often after an "incubation interval" when injected subcutaneously or intra-peritoneally. They are said to be just as infective, or more so, than the original cerebro-spinal fluid; (b) certain fluid cultures of cerebro-spinal fluid have been grown which have shown a "suspended haze", in which bacteria could not be demonstrated, but such cultures could be proven to be infective in monkeys; (c) post-mortem investigation of these monkeys did not result in recovery of cultures of the meningococcus; (d) the cerebro-spinal fluid from a monkey injected previously with the filtrate and running a temperature of 104° F., may fail to show organisms but gives this "haze" in the cultures, and injected into normal monkeys is capable of producing a high fever.

The evidence here presented by Hort, Caulfeild, and those working with them, is most interesting and while it is too soon to

arrive at any definite conclusion, further communications will be awaited with much interest. In the meantime well-sanctioned procedures adopted in the past to aid in diagnosis and treatment should certainly not be discarded.

The writer has been able to collect certain salient facts in regard to ninety-five cases of the disease occurring in Ontario since August, 1914. Of these cases, forty were patients admitted to the Hospital for Sick Children, Toronto, and I am indebted to Dr. Allen Baines for kind permission to utilize material contained in the clinical histories. I am similarly indebted to Professor A. McPhedran, Dr. W. B. Thistle, and Dr. G. W. Ross for their kindness in affording access to the histories of thirty-four cases treated in the Toronto General Hospital during this time. Lieut.-Colonel F. W. Marlow, of Toronto, has very courteously placed the available clinical histories of cases in the Second Military District at my disposal as has Lieut.-Colonel W. T. Connell, of Kingston, who, in addition has supplied eight cultures of meningococci. Finally, I wish to thank Dr. W. D. Scott, of Peterborough, and Dr. C. A. Drummond, of Meaford, for the trouble they have taken in furnishing data on cases treated by them.

An analysis of any considerable number of cases of meningococcus meningitis will usually reveal two types of the disease. First, the true epidemic and secondly, the sporadic cases. Those which I have analysed consisted of both sporadic and epidemic cases. The epidemic cases occurred chiefly at Exhibition Camp, Toronto, during the winter of 1915. At that time the disease was also epidemic amongst enlisted men in Belleville and London. The records of the cases in the last mentioned places are not available for this study. The first epidemic case at Exhibition Camp, Toronto, made its appearance on February 8th, 1915; four more cases were diagnosed between February 14th and 16th, and between this date and April 24th, eleven additional cases occurred, making sixteen in all. Of these eight died, and eight recovered. Energetic measures, to be discussed more fully later, were taken and the outbreak was soon checked. Having in mind the experience of the previous winter every care was taken to prevent an outbreak during the winter of 1915-1916. As a result possibly there were only six sporadic cases, three of which were in men billeted in centres outside Toronto. All six cases recovered under vigourous treatment. No two cases were in men of the same unit or in men living in the same building.

During this period between August, 1914, and April, 1916,

twenty additional cases were admitted to the Toronto General Hospital and thirty-eight were treated in the Hospital for Sick Children. It is impossible from a study of the histories to determine exactly the sporadic and the epidemic cases except in a certain few, as in the following tragic instance:

Mrs. A. H., age thirty-four. Admitted to the Toronto General Hospital, February 26th, 1915, with history of symptoms of meningitis dating back to February 22nd, died on the fifth day after admission.

John H., age eight, son of Mrs. A. H., admitted to the Hospital for Sick Children, February 27th, history of complaints of headache and sore throat dating only from day of admission, died on thirteenth day after admission.

Nellie H., age thirteen months, sister of John H., and infant daughter of Mrs. A. H., admitted to Hospital for Sick Children, February 27th, history of illness for two days. Nursed by mother until February 21st. Died on the second day after admission.

George H., age five, second son of Mrs. A. H., admitted to the Hospital for Sick Children, March 6th. History of illness of only a few hours duration, died on the sixteenth day after admission. This family of the mother and three children was completely wiped out by this epidemic tragedy. Furthermore, it is noted in the history, that a boarder at the home of Mrs. A. H. who was at Exhibition Camp also had meningitis and there was evidence suggesting that the mother contracted the disease from him. Here the contact and spread of infection was only too evident. The great majority of the other cases studied, however, might be classified as sporadic.

In this division into sporadic and epidemic cases it is well to recall the conclusions of Andrews, Bulloch and Hewlett[6] in their special report where they conclude that: "The epidemic is not one of cerebro-spinal fever as such but what may be termed a "saprophytic epidemic" of the meningococcus in the throats of the population at large, governed as to its local incidence by the opportunities afforded for transfer of the coccus from pharynx to pharynx. It is an epidemic prevailing in winter and early spring because climatic conditions bring people into closer contact indoors at that season; it dies out in summer for the converse reason. The conditions of camp and barrack life render it preëminently liable to affect the military population. It probably prevails in towns to a much greater extent than in the country owing to the closer aggregation of the population. This menigococcal epidemic presents no objective or subjective features to attract attention and is revealed only

by systematic bacteriological observation. Cerebro-spinal fever is an epiphenomenon of the epidemic. It is due to a secondary systemic invasion by the meningococcus from its saprophytic focus in the nasopharynx, occurring in sparse and isolated cases which appear as a rule unconnected with each other, At present we do not know the conditions which determine the secondary invasion, nor have we the data for judging in what proportion of the cases it takes place, though it seems a very small one. We know the number of cases of the declared disease but not the total number of cases with pharyngeal infection. As regards these latter we can only form a crude guess from the proportion of so-called "positive contacts" detected.

If we accept this view which had much evidence to support it in the analysis of the ninety-five cases here examined, the epidemic is one of meningococci in the nasopharynx and not of the so-called epiphenomenon, cerebro-spinal fever. At Exhibition Camp during the winter of 1915, something over one thousand swabs taken from the nasopharynx of "contacts" and other enlisted men were examined. In this number seventy-two positive carriers in all were found. In the same camp in the winter of 1916, fourteen hundred swabs were examined from contacts and mess-orderlies and only one positive carrier was determined, fifteen others being regarded as "suspicious". During the winter of 1915, fifteen cases of the disease were reported in about two months. In the same camp with somewhat more men in 1916, only three cases were reported in over four months. Here then we have seventy-two carriers and fifteen cases of the disease in two months during 1915, and one carrier and three cases, several months apart, during 1916. The interesting fact has to be kept in mind also that during March, 1916, numerous sporadic cases were reported to the Health Department in Toronto as having been observed in the city, and only one case occurred in Exhibition Camp. Even allowing for additional precautions it would seem that during the winter of 1915 we had an epidemic of meningococci in the naso-pharynx, and in 1916 only sporadic indications of such a condition.

Of the cases reported from outside points, about one half of Colonel Connell's fourteen cases seemed to be epidemic, others, however, were sporadic as were cases either seen or reported in Brampton, Brantford, Barrie, Peterborough and Meaford. Similarly the majority of the other cases in the Toronto General Hospital and the Hospital for Sick Children especially during 1916, seemed to have no direct connexion with any previous case of the same disease.

The essential difference, then, in this disease manifesting itself as an epidemic consists in the larger number of persons harbouring the microörganism and *pari-passu* the greater liability of more cases developing. The fundamental reason why we have so-called sporadic cases constantly and epidemics occasionally is not explained, nor can any satisfactory explanation be offered in the present state of our knowledge. The disease is probably much more prevalent than is generally supposed, but so little attention has been paid to the matter because of certain difficulties in the way of diagnosis and because only in times of epidemics or threatened epidemics has interest been aroused.

For the year ending December 31st, 1914, sixty-eight cases of so-called cerebro-spinal meningitis were reported to the Provincial Board of Health of Ontario. In this series fifty-five deaths were reported. It is impossible to tell how many of these cases were due to meningococcus and how many to other microörganisms. It is highly desirable that a bacteriological examination of the cerebro-spinal fluid be made in each case and certain diagnosis of the variety of meningitis be thus arrived at. The very high mortality is evident, and by comparing it with the sixty deaths in twenty-seven hundred and twenty-two cases of scarlet fever reported in the same year in Ontario, with sixty deaths in forty eight hundred and eighty-four cases of measles and with fifty-six deaths in seven hundred and ninety-eight cases of whooping-cough, it is further emphasized.

In the series of cases here reported diagnosis was made in all cases by an examination of cerebro-spinal fluid obtained by lumbar puncture. This should be done in every suspected case. In the majority of these cases smears only were made and only in about one fifth of the cases were cultures also obtained. In the present state of our knowledge, the demonstration of a very turbid cerebro-spinal fluid with enormous numbers of leucocytes, and the finding of Gram-negative diplococci inside or outside the cells, in smears, is probably all that is necessary in order to arrive at a diagnosis of meningococcus meningitis. It is desirable, however, when it is possible, that culture also be made.

Certain facts in regard to age, incubation period, history of onset, duration of illness, progress of case, treatment, outcome, etc., have been ascertained in about eighty of the cases here reported and they will next be briefly discussed.

In ninety-one cases in which the age was ascertained there were:

Under 1 year	7 cases	20 years to 25 years	12 cases
1 year to 2 years	8 cases	25 years to 30 years	8 cases
2 years to 5 years	11 cases	30 years to 40 years	7 cases
5 years to 10 years	16 cases	40 years to 50 years	2 cases
10 years to 15 years	4 cases	50 years	1 case
15 years to 20 years	15 cases		

Thus forty-two of the cases were between two and ten years of age, thirty-one between ten and twenty-five years of age and seventy-three of the ninety-one cases or 80 per cent. were twenty-five years of age or under. Apparently in this group of cases, children and young adults were about equally susceptible. Only 10 per cent. were over thirty years of age.

The incubation period of the disease is exceedingly difficult to determine from the history and the literature bearing on this point is meagre. In thirty-eight of the cases under consideration there was a fairly definite history of incubation as follows:

5 days or under	20 cases
6 days or under	3 cases
7 days or under	6 cases
8 days or under	3 cases
10 days or under	3 cases
11 days or under	1 case
14 days or under	2 cases

From this small group then it appears that twenty-nine of the thirty-eight cases had an incubation period of seven days or less and twenty of these twenty-nine cases five days or less.

It is well known, however, that an individual may harbour the microörganism in the nose for a long period of time, and eventually show symptoms of the disease. This is well illustrated in a case reported by Andrewes, Bulloch and Hewlett.

The onset in the great majority of all cases is very abrupt. Headache, vomiting, convulsions and sudden rise of temperature, were the characteristic symptoms of onset in about the order of frequency here named. Subsequently, retraction of the head and rigidity of the neck frequently followed. The degree of retraction and rigidity varied considerably but was almost always observed fairly early.

In only fourteen of seventy-six cases were rose spots or petechiæ noted, which is less than 20 per cent. This, however, may be due either to the fact that, in some cases they may have disappeared before admission to hospital, or were not mentioned in the clinical history. However, it is certain that in from 30 per cent. to 40 per cent. of cases, spotted-fever would be an inapt designation for this disease. Kernig's sign was observed in thirty-one cases in a series

of thirty-four. Taché cerebrale was less frequently observed. Disturbances of consciousness were present in almost all of the cases. Delirium was occasionally pronounced. The duration of the disease was quite variable. It has been stated that in epidemics, that the earlier cases are usually more severe and later cases are much milder. This seemed to be borne out at first, at Exhibition Camp, during the winter of 1915, when the first five cases all died, of the second five, only one died; however, of the remaining six cases, two died and these were the last cases occurring in the camp; so judging by this limited experience of sixteen cases the mildest cases are not necessarily the end cases.

One of the most characteristic findings of course is the change in the cerebro-spinal fluid. From a clear, watery fluid frequently not showing on the average one cell to the cubic millimetre of fluid, it becomes intensely turbid with a cell count of from a few hundred to 30,000 per c.cm. Oille, has attached certain prognostic significance to this high cell count in the cerebro-spinal fluid. He believes that cases with a count above 10,000 per c.cm. seldom recover. The cases with cell counts under 1,000 per c.cm., however, are also sometimes fatal. In thirty-four cases admitted to the wards of the Toronto General Hospital, an analysis plainly shows that in this limited number of cases, those with a cell count of 1 to 5,000 per c.cm. were more likely to recover than those with a cell count of from 5,000 to 30,000 per c.cm. The protein content of the cerebro-spinal fluid is also greatly increased in amount. The fluid is under markedly increased pressure and this is of diagnostic value and is a useful guide in treatment, because, with a clear fluid under only slightly increased pressure, the outlook is very favourable. Two or three cases have been observed where the fluid became so thick it would no longer run through the needle used for lumbar puncture. In one case this occurred within seven days of the onset of symptoms.

An analysis of the duration of the disease has revealed certain interesting features. In eighty-nine cases, the condition has varied in duration from one to one hundred and forty-three days. In forty cases where the duration of the disease was twenty-four days or less, nine recovered (sixteen of the forty cases died in less than seven days), thirty-three cases lived from twenty-five to fifty days, of this group twenty-four recovered and nine died. One case was reported cured after ten days, this is the shortest time in which any patients were discharged as recovered. The remaining sixteen cases lived from fifty to one hundred and forty-three days, of these eleven recovered and five died.

Thus the death rate in the cases of three weeks or less duration was 77 per cent.; of those in which the duration of the disease was from twenty-five to one hundred and forty-three days the death rate was only about 35 per cent. The progress of the case is best followed by careful examinations of the cerebro-spinal fluid. Where this does not clear up, where headache and opisthotonus continue and where mental dullness increases the outlook is very grave. In those cases where the fluid does not clear up the prognosis is hopeless. Even where the fluid does clear up death may ensue eventually from a basic-meningitis. Sometimes a plastic exudate walls off the infecting agent; increased pressure results and even if death does not occur hydrocephalus or other complications result. A sudden exacerbation in temperature may also be a danger signal of a relapse especially if delirium is an accompanying symptom, as pointed out by Neal.[7] Neal believes also that the reduction of Fehling's solution by the cerebro-spinal fluid is a prognostic point of importance. The outcome in a given case depends upon so many factors that a guarded prognosis at the outset is usually desirable.

Perhaps the most interesting part of the subject is that which relates to treatment. Since the work of Flexner, Park and others in America, it has come to be accepted that the death rate from meningococcus meningitis has been reduced from about 75 per cent. to 25 per cent. or 30 per cent. The following statistics quoted by Kolmer[8] tend strongly to uphold this point of view.

	Cases.	Average Mortality.
Flexner	1294	30·8 per cent.
Dopter	402	16·44 per cent.
Netter and Debre	99	28 per cent.
Sophian	161	15·5 per cent.

Furthermore the results of Christomanos in the recent severe epidemic in Greece were eminently satisfactory. Simlarly Ker, of Edinburgh, and Gardner Robb, of Belfast, have had most excellent results. In a recent symposium held at the Royal Society of Medicine, Sir William Osler[9], Gardner Robb, H. D. Rolleston, Foster, Gaskell, Sutherland, and Neave contributed to the discussion and their remarks have aroused much interest. With the exception of Robb, all these authors reported disappointing results from the use of anti-meningitis serum. Robb whose experiences with the epidemic form of the disease is much the most extensive of those just named has a mortality in one series of one hundred and twenty cases or 24 per cent., and in another series of one hundred cases a mortality of 36 per cent. The explanations of the failure

of serum treatment in the hands of the English observers have been varied, but the potency of the different sera used has been seriously questioned.

In the series of ninety-five cases here reported, forty-six died and forty-nine recovered. These results, as a whole, are not satisfactory. An endeavour has been made to determine in different cases the origin of the serum used in the treatment, but this has been very difficult. However, recent communications by Ellis[10] and Arkwright[11] have shown that amongst meningococci there are various strains of these microörganisms which may account for the fact that a serum may not contain antibodies for the organisms responsible for the production of cases of the disease. In this way an absolutely inert serum quite incapable of agglutinating the meningococcus isolated from the given case may have been used in the treatment. To determine whether this is a factor of importance, we are at present immunizing horses for the first time with strains of meningococci from cases occurring in Ontario combining with them strains obtained from the Rockefeller Institute. The most recent method of immunization described by Amoss[12] is the one being used. At present fifty-two cultures of meningococci are being utilized in this laboratory for this purpose. R. D. Defries working in the Antitoxin Laboratory of the University of Toronto has devised a combination thermos-hot-water-bottle outfit which is being used to send out to physicians reporting cases of the disease. The physicians are supplied with culture media and directions are enclosed as to the method of obtaining the fluid for the culture. It is hoped that in this way a serum will eventually be obtained which will be effective in materially lessening the death-rate from meningococcus meningitis in Ontario.

The method of procedure when a suspected case of meningococcus meningitis is seen, is to do a lumbar puncture at once. A general anæsthetic (chloroform) may be used if necessary. Gardner Robb, Captain Michael Foster, and we ourselves, believe this to be frequently desirable. Smears, and if possible cultures, should be made at once. It is useless and only confuses the issue, to inject serum if an organism, other that the meningococcus is demonstrated in the fluid. If no organism is demonstrated in a thick purulent fluid, cultures should be attempted if at all feasible and serum used. Daily lumbar punctures should be made until the pressure becomes normal. Thirty to forty c.c. or more fluid may be withdrawn at each puncture and slightly less serum introduced. Certain of the English writers mentioned above, believe that lumbar puncture alone is of great value and does as much good as serum.

This latter is very questionable. Serum should be used in considerable quantities and at regular intervals as pointed out in the article by Neal, already quoted. Connell[13] recommends that serum be given not only intra-spinally but also intravenously and by intramuscular injection. In a series of fourteen cases so treated he had thirteen recoveries. This method of treatment is based on the view expressed by Lundie, Thomas, Fleming and Maclagan[14] that there is a septicæmic stage in the disease. The cases should be isolated and all the usual measures taken to make certain that the patient will not infect others. Further prophylactic proceedings in camps or where the disease is widespread consist in swabbing to determine possible carriers. The sterilization of all dishes used in common, by enlisted men, is insisted upon at Exhibition Camp. Routine swabbing of cooks and mess orderlies has also been instituted. These precautions with avoidance of overcrowding in stuffy, ill-ventilated quarters will undoubtedly minimize the opportunities for transference of the meningococcus from one individual to another.

The writer is indebted to Dr. George M. Cameron and to Miss Olive Sheringham for assistance in abstracting histories.

BIBLIOGRAPHY

1. Weichselbaum. *Fortschritte. d. Medizin*, 1887.
2. Councilman Mallory and Wright. "Special Report Massachusetts State Board of Health, 1898."
3. Hort Lakin and Benians.
   (a) *British Medical Journal*, March 27th, 1915.
   (b) *Ibid*, April 24th, 1915.
   (c) *Journal of the Royal Army Medical Corps*, February, 1916.
4. Medical Research Committee, 1916. "Report of the Special Advisory Committee upon Bacteriological Studies of Cerebro-Spinal Fever during the epidemic of 1915."
5. Caulfeild. "Personal communications, March and April, 1916.
6. Andrewes, Bulloch and Hewlett. "Report of the Special Advisory Committee upon Bacteriological Studies of Cerebro-Spinal Fever during the epidemic of 1915," p. 56.
7. Neal. "Treatment of cases of epidemic meningitis." *Journal American Medical Association*, March 18th, 1916, pp. 862-864.
8. Kolmer. "Infection, Immunity and Specific Therapy." 1915. P. 747.
9. Osler, Robb, etc. *The Practioner*. War No., January, 1916. Pp. 2-34.
10. Ellis. "A classification of meningoccoci, etc." *British Medical Journal*, December 18th, 1915.
11. Arkwright. "Grouping of the strains of meningococcus." *British Medical Journal*, December 18th, 1915.
12. Amoss and Wollstein. "A method for the rapid preparation of anti-meningitis serum. *Journal of Experimental Medicine*, March, 1916. Pp. 403-418.
13. W. T. Connell. "Personal communication," April, 1916.
14. Lundie, Thomas, Fleming and Maclagan. *British Medical Journal*, March 20th, 1915, p. 493. May 15th, 1915, p. 836.

THE DEFINITE TREATMENT OF PNEUMONIA:

With a Report of the Germicidal Power of Quinine and other Cinchona Derivatives upon Pneumococcus Cultures *in vitro.*

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(*Author's Abstract*)

Clinical

FOR generations quinine has had a traditional, empirical reputation as a potent agent in the treatment of lobar and lobular pneumonia and similar maladies. Systematic employment of the drug according to a definite plan, for a period of twelve years—thus during seasons of varying meteorology and epidemic virulence—has given abundant evidence of the correctness of this tradition.

In many of the cases so treated, recovery would probably have been as certain without the drug as with it; but in no case did it prevent recovery, and in a large number it averted death. Some patients in the author's service do not receive it. As a rule, however, the initial dose is given on admission, and repetition is determined by circumstances. In those cases which give no indication for repetition of the dose, recovery is practically invariable. In the severer cases—those calling for repeated doses—mortality has been greatly reduced even among alcoholics and derelicts; and the clinical picture is commonly changed from profound distress to comparative comfort, not only in cases of happy ending, but also in the fatal ones. In other words, toxæmia is overcome or minimized. Thus cough is not troublesome, delirium and insomnia are much less frequent, and respiration, even when rapid, is not laboured in anything like the ordinary degree. Hence the use of hypnotics, of sedatives, and of oxygen, is rarely called for. The best results are observed in patients seen not later than the third day of overt

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symptoms—which may be the seventh or tenth day, or even later, of actual disease—and in those less than fifty years of age; but surprising recoveries are met with in late cases and old persons.

Two significant features of the clinical picture are to be emphasized; first, the common change from critical to gradual termination (lysis); second, the extreme rarity of cinchonism (two cases in five hundred), notwithstanding the enormous doses of quinine sometimes administered. Cinchonism, profuse sweating, or marked fall of blood-pressure following the use of quinine call for caution; perhaps for withdrawal of the drug. In no case of the author's has there been quinine amaurosis. One case of amaurosis has been reported to him by a pupil, but the trouble was transient, and the patient was saved from what seemed to be impending death.

The treatment to be outlined, however, is not specifically treatment by quinine. Quinine is used as the "big gun" in its tactics, but if a better gun is found, this could be substituted without changing the strategy of the method. It is termed the *definite treatment* of pneumonia, to distinguish it from the vagueness of expectancy on the one hand, and the exactitude of specific treatment on the other hand. It is not primarily, or chiefly germicidal. In pneumonia, after the first day, more is needed than merely to slay the microscopic Goths and Huns. We must protect the body against the poisons which they manufacture, or which may be manufactured by the enslaved or struggling tissues. We do not know as yet what the pneumonia poisons are. We merely observe their effects. The definite treatment is directed chiefly against these. Its *strategical* plan is based upon an analysis of the phenomena of crisis, and seeks to avert the profound and dangerous disturbances of that period. Into this plan, a number of *tactical* measures, old and new, are incorporated; varying with the condition of the patient, the environment, the available means; and modified according to the effects produced. As gradually developed in the writer's services at the Philadelphia General Hospital and the Hospital of the Jefferson Medical College, it comprises the following features:

A. General:

1. An abundant supply of *fresh air,* preferably in the open, and with due care to preserve the warmth of the body by adequate covering, and if necessary, external heat.

2. All the esentials of *good nursing;* including *rest,* proper *diet,*

and the free use of *water*, internally and externally. Copious *diuresis* is especially sought.

3. Keeping the *thorax constantly warm* by poultices during the day and a lamb's wool jacket at night. This may be preceded, in early cases, by *counter-irritation* with a mild mustard and flour poultice.

4. A due supply of *chlorides* by saline infusion (Henry's method), alkaline-saline beverage (author's method), or the administration of a mixture of the chlorides in capsule, followed by copious drafts of water (Quimby's method).

5. Such additional measures of *elimination* (and *alkalinization*) as may be necessary.

6. *Cleansing and* (relative) *disinfection of the upper air passages* by local applications to the throat and nose (phenol-iodine-glycerin or silver preparations), or by continuous inhalation (from the perforated zinc respirator of Yeo) of volatile antiseptics, stimulating or sedative (*e.g.* ethyl iodide, creosote, chloroform, terebinthinates).

This represents a *ground work* upon which certain *definite* medication is superimposed.

B. Special:

1. Antitoxic Agent. Quinine is given *promptly in massive and repeated doses* (for a vigourous adult, 1·6 to 1 gm. (25 to 15 grains) *circa q. iii h.*) with *progressive lessening of quantity and increase of interval*, according to effect; the drug being intermitted when the temperature (taken in the mouth) tends to remain below 102.·5°F., and resumed when it tends to rise above 103°F. The temperature curve, however, is taken as an *index only*, since the treatment is not designedly antipyretic; and temperatures too low are not desirable. This medication may be kept up for one, two, or three days. There may be one dose of quinine only, or so many as fifteen. The rule is effect, not quantity—*enough and no more.* Perhaps four to five doses is a fair "average". *Quinine and urea hydrochloride* (25 to 50 per cent. recent (sterile) solution*) and *intramuscular injection* (through the *iodized skin*†) have been chosen as, on the whole, the most effective preparation and method; but other quinine salts, and administration by the mouth, are likewise employed. It is possible that other cinchona derivatives,

*It is best made extemporaneously with boiling water, and used at a moderate heat.

†The point of puncture should be sealed with collodionized cotton.

for example *methyl-hydro-cuprein* (hydroquinine) *hydrochloride* may prove useful. The narrow interval between the toxic dose and the therapeutic dose of *ethyl-hydrocuprein* (optochin), however, inhibits the general use of this drug and its salts at present, despite their high bactericidal power. Some modification of the molecule may remove this drawback, and is a worthy objective of experiment.

2. Pressor Agents. *Cocain hydrochloride, caffeine-sodio-salicylate, adrenalin, posterior-pituitary principle*—singly or in alternation or rotation—are used, *when necessary*, to maintain the line of *systolic blood-pressure* at or above the level of *pulse frequency*, as charted by Gibson's method. The *pituitary preparation* has the additional advantage of tending to prevent tympanites and dilatation of the stomach. Usually a precautionary injection of cocain ($\frac{1}{2}$ grain, 0·03 gm.) or posterior-pituitary solution (1 mil.) is made with the first injection of quinine, since the latter tends to lower blood-pressure slightly. It is repeated every third hour, or as needed. In some cases so many as sixty doses have been given. In others from three to ten. In some, none at all.

3. Cardiants. *Diastolic blood-pressure* and *respiration* are charted on the same vertical (imitating Gibson's pulse-systolic pressure ratio); and an interval of less than ten points is considered a signal of danger, perhaps calling for the use of *camphor* or *digitalis* in full doses. Sometimes both agents are employed. In the majority of cases, neither of these drugs becomes necessary. Digitalis effects can be obtained more readily when the patient is under the influence of quinine than in other cases. Concerning both pressor agents and cardiants, care is, of course, necessary not to exhaust by overstimulation. One is to be "bold, but not too bold" —nor too timid. *Oxygen* is sometimes helpful in overcoming this condition; not by direct effect on the heart apparently, but indirectly through its general action.

4. Auxiliary and Symptomatic Measures. *Wet cupping, dry cupping, venesection*, and the continuous or occasional use of *oxygen, alcohol, strychnine, atropine, opium, musk, creosotal ammonium carbonate* and other drugs are reserved for *special indications*, which may or may not be present in any given case. Cases calling for *early bleeding* are not often seen, but *late blood-letting* to relieve the right heart is occasionally called for, and may prevent death by pulmonary œdema, if done in time.

5. Roborant in Convalescence. *Tincture of ferric chloride*

is given when the quinine is withdrawn, and continued during convalescence.

6. Specific Stimulation. In prolonged cases with extensive lesions, in certain cases of tardy defervescence, and in all cases of delayed resolution after defervescence, a *personal bacterin* (so-called autogenous vaccine) is used in progressively increased amounts, with appropriate intervals (three to seven days) between doses. Repetitions and increases of dose are largely guided by the temperature and leukocyte reactions.

The early employment of bacterins has not seemed advisable or beneficial, though in a few cases it was tried and did no harm.

7. Iodin. Observations as to the value of iodin (in colloidal and other forms) as an adjuvant in cases with extensive lesions and tardy defervescence, are as yet too few to be conclusive, though on the whole they seem to indicate a favourable action.

8. Individualization. In all features of the treatment there must be careful *adjustment* of means and measures to the *special needs* of the *particular patient* at the *moment*. One must not only know when and how to use medicines; but also watch and know when to *withhold them*. All the measures mentioned are not to be applied in every case. In most cases but one or two will be needed; but in some cases at one period or another, several may be indicated and one must not fear to use them. Routine is inferior to discretion. Too much is worse than too little, but too little is not good. The aim is to be "just right".

Experimental

Clinical observation has emphasized on a large scale—not merely in isolated instances—two facts in regard to the action of quinine in the pneumonias: (1) The conversion of *defervescence* from crisis to lysis; and (2) the virtual absence of *cinchonism* under repeated doses, at times enormous, of an active cinchonic. Adding to these the invariable abatement—if not suppression—of toxæmic symptoms, the inference is natural that the drug acts as a *chemical antitoxic*. In other words, there seems to be *reciprocal neutralization* between the drug and something in the patient's body. Quinine overcomes the pneumonia poisons and the pneumonia poisons protect against quinine. This view is confirmed by the fact that despite the relief—sometimes wonderfully prompt and complete—to symptoms, the physical signs pursue the ordinary course, indicating that quinine does not affect in an appreciable degree either

the evolution or the involution of morbid tissue changes. Roentgen ray studies and autopsies show this to be the case. Also, the occurrence of pneumococcus empyema in a certain proportion of cases and the continued findings of viable pneumococci in the blood and sputum, seem to confirm the opinion that the greatest value of the drug *does not depend upon its germicidal* action.

These views have long been before the profession, but only recently has it been possible, through a generous subvention from Mr. Samuel Fels, of Philadelphia, to undertake experimental studies to test and determine the facts with reference to the three distinctive types of pneumococci.

These experiments are still in progress, and only one phase is ready for report; namely, that concerning the germicidal action upon pneumococci of the various drugs studied. In this work the author has been so fortunate as to secure the coöperation of Dr. John A. Kolmer, of the University of Pennsylvania, in whose laboratory, and under whose direct supervision the observations have been made, with the assistance of Dr. George D. Heist.

A detailed report will be published elsewhere (*Transactions Association of American Physicians*). For the present it may be stated that the research has been carried far enough to show a distinct germicidal influence *in vitro*, of all cinchona derivatives, upon the three distinctive types of pneumococci. Certain differences appear in the relative values of the various salts of quinine, all of which are much less potent than ethyl hydrocuprein, but all of which show dinstinct and high germicidal activity—not only inhibiting growth, but also killing the pneumococci of all three types observed (I, II, and III). Quantitative differences in the germicidal values of the different agents tested, with respect to the different types of pneumococci, have also been observed; but these are much slighter than were expected.

Cross observations with other germicides (*e.g.* mercuric chloride, phenol. and arsenobenzol) show that while these exert some bactericidal effect upon pneumococci it is insignificant in comparison with that of the quinine group. Similarly, while the cinchona derivatives not only inhibit the growth of other bacteria (*e.g.*, *Bacillus typhosus, Staphylococcus aureus*) but also destroy them, the concentration necessary is very many times greater than that fatal to pneumococci. It may thus be positively stated that the experiments show a distinctive relation (bacteriotropism) between cinchona derivatives and the three types of pneumococci. So far as *ethyl hydrocuprein* is concerned, these observations merely confirm

the work of previous observers (Fränkel, Morgenroth and Levy, Moore and others) signalizing this drug as the pneumococcus-slayer *par excellence*. Clinical studies, however, do not show the same superiority of ethyl hydrocuprein over quinine in the treatment of any type of pneumonia, even when the former is reinforced by a specific serum—and this, notwithstanding the fact that such reinforcement has been shown to increase its germicidal value enormously in experimental pneumococcus infection in rabbits. (Moore.)

Moreover, ethyl hydrocuprein is much more toxic than quinine, causing in laboratory studies upon normal animals much greater central depression of blood-pressure and earlier cardiac paralysis. (Smith and Fantus). A further fact to be noted in passing is that in the tests made in Dr. Kolmer's laboratory by Wright's method, *the proportional decrease of germicidal activity in serum* below that shown in salt solution is much greater for ethyl hydrocuprein than for the quinine salts.

Experiments *in vivo*, and especially the more important experiments concerning the relation of quinine and allied compounds to the pneumonia poisons, are not yet sufficiently advanced to be the subject of report. So far as they have gone, however, they tend to confirm the observations *in vitro*. Meanwhile parallel studies by other investigators are invited, for confirmation, correction or extension of the results, clinical and experimental, obtained at Philadelphia.

THE TRANSTHORACIC OPERATION FOR CHRONIC EMPYEMA AND FOR BRONCHIECTASIS

By F. N. G. Starr, M.B.

IT is now many years since I had as a patient in the Hospital for Sick Children, a little girl suffering from a most malignant form of osteomyelitis. During the progress of the disease she developed a pneumonia of the right lung, followed by abscess formation. One day, when examining the chest for "progress notes", I heard a "noise" through the stethoscope like an explosion, followed by a bubbling sound, and a marked alteration in the physical signs. Thinking that this meant rupture of the abscess, I put a needle into the eighth intercostal space and got pus. Under local anæsthesia I then made a small skin incision over the ninth space, and pulling this incision up to the level of the eighth space I thrust the knife into the pleural cavity, and, using the blade as a director, carried a drainage tube with a sinus forceps into the chest cavity. The knife was then withdrawn, and about 6 oz. of pus escaped. The tube fitted accurately and passed from without obliquely upward. When the patient inspired, the tube was open for drainage, and during expiration the tube closed and permitted the entrance of no air into the cavity. The drainage ceased in about ten days and the wound was allowed to close. I rather think that this is an instance of the most prompt treatment of empyema on record. The pus was evacuated from the pleura within fifteen minutes of its first appearance in the cavity. Mention of this case is made for three reasons:

First—one would rarely have to deal with old empyemata if the diagnosis were made early, and this, or similar treatment, such as goes by the name of "Holt" nowadays, were promptly adopted.

My second reason is,—to call attention to a possible causative factor, namely, that during the resolution of a pneumonia there is often a small, localized abscess, perhaps in an interlobular fissure, which may rupture into the pleural cavity.

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The third reason is—that this same localized abscess, instead of rupturing into the cavity, may rupture into a bronchus, thus becoming the forerunner of a bronchiectasis.

If the empyema is an old one that has been treated as a slowly-resolving pneumonia for six or eight weeks after convalescence should have been well advanced, so that time has permitted a lung already damaged by pneumonia, to become collapsed, and adhesions between the visceral and parietal pleura to have occurred, then this treatment is hardly sufficient. The cavity should first be aspirated and the lung examined from day to day to estimate the amount of expansion that has occurred. After three or four days it is again aspirated. This may be done two or three times, in the hope that some expansion of the lung may occur. If one sees evidence of increased expansion one may put in a tube, to which is attached a Sprengel pump, or a siphon drainage, to see how much can be gained. Failing to get much expansion, the patient is prepared for radical treatment. He is put on his sound side on a table broken amidships, in order to get good extension of his damaged side. An incision is then made from the junction of the costal cartilage and the rib, parallel to the line of the rib, and close to the upper border back to the angle. The muscles are cut through down to the pleura and all bleeding stopped. The pleura is then incised throughout the length of the incision, the fingers inserted between the ribs, and the space stretched open, and a Balfour self-retaining, abdominal retractor is inserted, when one has complete command of the situation.

A suction tube is put in and any pus that has accumulated since the last tapping is evacuated. Large placques of lymph or fibrin are then removed; adhesions that exist between the parietal and visceral pleura are then divided, and the lung mobilized. During the process of mobilization one will likely find, and open, localized pockets of pus. The lobes are then carefully separated, when more pockets may be discovered. This all helps to provide for free drainage and for some expansion of the damaged lung.

At this stage of the operation one takes stock of the situation and carefully reassures himself that all bleeding points have been secured. A very sharp scalpel is then used to make linear incisions, preferably in a vertical direction, through the fibrinous coating of the pleura. In my limited experience there was very little bleeding, unless the lung tissue was entered, and this, so far, has not been serious.

I have been astonished when stripping these incised bands from

the surface of the lung, to see how quickly the expanding lung controls the hæmorrhage from these superficial wounds. Should the bleeding be severe, it might be safer to use the cautery knife for the linear cuts.

When several of these linear incisions have been made, one begins by peeling off each second strip, until the whole surface has been denuded.

The retractor having been removed, the muscles are then drawn together with catgut and the wound closed, except at its extreme posterior extremity. Here a drainage tube, *without lateral openings*, and long enough to reach to the bottom of the pleural cavity, is inserted. The reason for this is obvious. When the patient returns to bed a Sprengel pump is attached, and as soon as the patient feels fit he begins blowing water through a tube from one container to another.

In a bronchiectasis the same method of exploration may be followed. Upon locating the cavity, one may either attach the lung to the chest wall and drain, or he may dissect out the cavity. I have done both. The latter is a hazardous procedure at best, as for a few seconds the hæmorrhage is terrific, but I have been surprised to see how easily it is controlled by a few mattress sutures. These it is wiser to insert before the excision is done. Probably better still would be preliminary ligature of the branch of the pulmonary artery going to the particular lobe to be attacked.

In putting these few observations together I have purposely omitted much that might be said upon both subjects. My main object, however, besides calling attention to one of the newer procedures* is to elicit a free discussion, and thereby impress upon members the necessity of making an early diagnosis, when the treatment is simple.

While the operation is in progress it is well to give from 40 to 60 oz. of saline solution subcutaneously, to obviate shock. In the after care the patient may require one or two doses of morphine, or until all danger of shock has passed.

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*Howard Lilienthal—*Trans. American Surgical Association*, 1915.

BLOOD TRANSFUSION IN HÆMORRHAGE OF THE NEWBORN

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THERE are few diseases or conditions in infancy which have attracted more attention than the hæmorrhages which occur during the first two weeks of life. The enormous literature devoted to this subject consists in part of case reports and collected statistics bearing on the frequency, the etiology, and the treatment, and in part of investigations concerning the exact causation of the bleeding.

The anatomic lesions disclosed by post-mortem examination have been inconstant, and divergent views have been held by different observers concerning the causation of the hæmorrhage. The so-called hæmorrhagic disease of the newborn has been attributed to general diseases, inherited or acquired; to birth injuries; to mechanical causes; and to primary defects or alterations of the blood or vessels. Within the last few years there have been a number of important investigations on the physiology of the blood, and on the etiology and treatment of various hæmorrhagic conditions.

The frequency with which spontaneous hæmorrhage occurs in the newborn varies in the experience of different observers. According to Silvermann there were thirty-seven cases of gastro-enteric hæmorrhage in a total of 29,333 births; Kling recorded seventeen cases in 13,000 births. Winckel, Gerhardt and Rebemont, state that umbilical hæmorrhage occurs once for each 5,000 births. Nohl cites a ratio of one case to 1,816 births. In the Infants' Ward at the Toronto General Hospital there has been but one case in 1,200 births.

Before dealing with the therapeutic measures in this disease, it would not be amiss to review briefly the various theories as to the etiology. During the earlier period of investigation the so-

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called hæmorrhagic disease was ascribed to widely varying causes. Among these are, asphyxia from prolonged labour, general plethora, congestion of the mesenteric arteries, respiratory embarrassment, vascular thrombosis, rupture of blood-vessels, irritation due to swallowed amniotic fluid, and too early ligation of the umbilical cord. By many of the older authors hæmophilia was considered an important cause but we know now that hæmophilia is not manifested in the newborn..

It has long been recognized that many infectious diseases may present hæmorrhagic types and there is considerable evidence to show that bacterial infection may be responsible for hæmorrhage in the newborn. This evidence is of both clinical and bacteriologic nature. The results of the bacteriologic studies have been very inconstant, the pus cocci, the colon bacillus, typhoid bacillus, bacillus enteritis, bacillus lactis ærogenes, the diptheria bacillus, the bacilli hæmorrhagica of Kolb, the pneumococcus, the pneumobacillus of Friedlander, and several unclassified organisms have been recovered, either single or in combination from the bodies of infants who had hæmorrhage during life. It is therefore seen that no specific organisms have been discovered. The multiplicity of organisms, and the comparative infrequency with which different observers have isolated the same bacteria—excepting perhaps the pus cocci—merely indicate that hæmorrhage in the newborn may occur during the course of bacterial infection. Hæmorrhage due to syphilis alone probably does not occur, the luetic infection predisposes to bacterial invasion which results in hæmorrhage. Among the less frequent causes may be mentioned local lesions. such as gastric or intestinal ulceration, which it must be admitted are indeed most rare.

In addition to the above mentioned etiological factors the ultimate cause of the uncontrollable hæmorrhage is to be sought in some abnormal condition of the blood. Recent observations show that there is a clinical type of spontaneous hæmorrhage in the newborn infants for which no definite etiologic agent has been established. From the evidence available at present it seems only rational to suppose that the persistent hæmorrhage is directly dependent on some biochemical blood defect or change. But whether an abnormality of the blood or vessels is the primary etiologic factor, or whether the hæmorrhage is always secondary to some infection or disease, can only be determined by future investigation. Thus far researches into the biochemical nature of the affection have failed to throw any light on the subject.

Mortality

The mortality in the hæmorrhagic conditions of the newborn ranges from 35 per cent. to 87 per cent. In the collective cases of Townsend the mortality was 79 per cent.; in those of Silvermann, 56 per cent. In cases of gastro intestinal hæmorrhage Shukowsky observed a mortality of 62 per cent., while in the collective statistics of Vasmer the mortality was 32·8 per cent. In umbilical hæmorrhage the mortality observed was from 68 per cent. to 100 per cent.

Treatment

The futility of most therapeutic measures in the hæmorrhagic disease of the newborn is shown by the high mortality. Recently, however, several measures have been advocated which have given more promising results.

The use of calcium salts to control the hæmorrhage has been generally disappointing; it is true isolated cases have recovered but in the greater number the medication has been without effect. Judging from the reports of continental writers the administration of gelatin is of great value. Since its introduction in 1899 a number of favourable cases have been reported, such as a mortality of only 8·8 per cent. in one hundred and sixty-nine cases. In contrast to this, Shukowsky's series of cases indicate that the results are not all that might be desired.

In addition to these, many other preparations have been used with but little success. Following the publication of Weil, animal blood sera have been used for the treatment of hæmorrhage in the newborn. Judging from recent publications the most promising line of treatment, exclusive of transfusion, is by means of human blood or its derivatives. In 1910, Welch reported twelve cases of hæmorrhage in the newborn successfully treated by subcutaneous injections of human blood serum. A number of the patients suffered from severe hæmorrhage, and the treatment was followed by immediate improvement. Schloss and Commiskey treated seven infants with hæmorrhage by means of subcutaneous injections of human blood with but one fatality. The blood was taken from one or other of the parents and injected before coagulation into the subcutaneous tissues. In every case the blood was entirely absorbed within a few hours, and so far as could be determined, had no bad influence on the patient's general condition. The subcutaneous injection of whole blood is not without hypothetic objections. The formed elements possibly act as foreign material and

must be broken up and excreted. In only two instances have we used this procedure in both of which the result was most satisfactory.

It is always hazardous to draw conclusions from small series of cases, and this danger is very real in reference to the treatment of the hæmorrhagic conditions of the newborn. The hæmorrhages are of varying severity and are due to a still undecided etiology, probably some of the cases recover spontaneously, and this is indicated by the number of therapeutic measures which have given favourable results in isolated cases. The true value of any therapeutic agent can be judged only by a large series of cases.

The great theoretical and practical objection to all these methods is the fact that the hæmorrhage is stopped but the amount of blood lost is not replaced, and while admitting this may not be of decided import in many cases when the hæmorrhage is small it is of vital importance when the amount of blood lost is large and the infant almost exsanguinated. In my own experience I am cognisant of two cases where initial transfusion would have prevented later trouble. In one instance after a moderate hæmorrhage a severe degree of atrophy or marasmus set in and in another the child had suffered from chronic indigestion for almost a year which promptly vanished after blood transfusion; if the transfusion had been performed in the initial stage, it is reasonable to assume that neither of these lives would have been jeopardized.

Infants are susceptible to the effects of hæmorrhage. A baby of eight pounds is estimated to have a total quantity of a little more than eight ounces. Since a dog cannot always survive a loss of one half the total quantity of blood it is fair to assume that the loss of an exsanguinated infant is about one half the total quantity. Thus I feel, in dealing with hæmorrhagic disease of the newborn, it is not safe to temporize too long with measures which may check the bleeding but cannot relieve the anæmia. Hence the advantage of transfusion over serum injections.

Embolism, sepsis, the transmission of disease, and even hæmolysis are of much less frequent occurrence than was formerly supposed. The danger of hæmolysis has been exaggerated by most writers. Crile says that "Kinship between donor and recipient is apparently of no special advantage and the laboratory test may show hæmolysis and yet the same blood be entirely safe in transfusion." In only one of our series was a hæmolysis test

made and that was positive, but absolutely no evidence of blood destruction was observed following transfusion.

Properly safeguarded transfusion is not a dangerous operation. The withdrawal of too much blood from the donor and the dilation of the recipient's heart are usually avoidable mishaps. The introduction of air bubbles both large and small, contrary to the general opinion have caused absolutely no harm. Experimentally this observation has been confined by Bruce Robertson when almost a syringeful (10 c.c.) of air was introduced into a dog's femoral vein producing only a momentary cyanosis and then complete recovery with apparently no bad after-effects.

The amount transfused may be controlled to a certain extent by the estimation of the hæmoglobin, but it must be borne in mind that the introduction of whole blood acts as a stimulus to the hæmatopœtic organs, with a result that from twelve to fourteen hours following the cessation of transfusion the hæmoglobin may read from ten to thirty points higher. In newborn infants from 90 to 120 c.c. is sufficient to stop the bleeding and restore almost the total quantity of blood or approximately 15 c.c. for every pound of body weight.

Though the operation of blood transfusion is by no means a new one, it has taken many years to reach the present varieties of technique and by no means has the last word on it been said, as is evidenced by the overwhelming number of articles appearing in the current literature describing various forms of apparatus and methods of technique. In a paper such as this it would be impossible to refer to the numerous procedures except to record the fact that Dr. Unger's apparatus is credited with giving the greatest satisfaction in adult work.

The technique employed by us is, with certain modifications, the Von Ziemssen method as revived and improved by Lindemann, of New York. The instruments used are a set of six 20 c.c. ground glass syringes, two luer needles, one of small and the other large bore, which have smooth unbevelled tips, a set of small dissecting instruments and a pair of curved foreign-body forceps, such as are used in eye work. All instruments are sterilized by boiling and the syringes and needles are lubricated on the inside by washing through them sterilized liquid paraffin. The following detail applies to the procedure as carried out.

Having sterilized the skin by painting with 2·5 per cent. tincture of iodine, select the most superficial vein in the antecubital region of the recipient's left arm, anæsthetize the skin with a 0·5

per cent. novocaine solution, and apply constriction, just below the shoulder sufficient to prevent the venous return. With fine dissecting instruments expose and free the vein for a distance of half an inch, ligate it at the distal end of the wound and release the tourniquet. At the point in the vein selected for the entrance of the needle make an oblique opening into the lumen of the vessel—if the lumen is too small to admit the needle, dilate the vessel by introducing a fine pair of curved foreign body forceps such as used in eye work. Tie the needle to the vein and allow it to fill with blood. A saline syringe is now attached and a small quantity of salt solution injected to clear the needle of blood.

When the recipient's vein has been entered, a needle is introduced into an elbow vein of the donor and a syringe attached. If the needle is introduced in a direction opposite to that of the blood stream, it will be found that the syringe as a rule will fill more quickly, particularly if moderate constriction is applied above the elbow as the piston of the syringe is being drawn out.

As soon as the assistant has obtained 20 c.c. of blood from the donor the blood-filled syringe is passed to the operator who substitutes it for the saline syringe previously attached to the recipient's needle. The injection of blood is made at a moderate rate of speed, and as soon as the syringe is emptied it is immediately replaced by a saline syringe and sufficient salt solution injected to clear the needle of blood. In the case of the donor a saline syringe is attached and needle cleared in the intervals between the successive withdrawals of blood. The time required for filling and emptying a 20 c.c. syringe in this manner should not occupy more than fifteen seconds. The blood may be injected at the rate of 20 c.c. to the minute. In one of our cases in which the weight was only four pounds and the general condition was very poor, the injection of blood was carried out too rapidly for the accommodation of the circulation, and the patient showed signs of sudden overdistension of the right heart and pulmonary circulation and died in spite of attempted withdrawals of blood both from vein and heart.

The chief difficulty to be encountered in the cases with plenty of subcutaneous fat is in defining and introducing a needle into the vein but very little experience enables one to incise directly over the vein while a little separation of the tissues with artery forceps readily reveals the vessel. Following transfusion it is quite usual to see an abrupt rise in the pulse rate and possibly some irregularity. A rigour may or may not accompany the temperature rise,

but does not last long and the temperature subsides wthin a few hours.

As compared with the method of direct transfusion the syringe cannula method is very much simpler, as a much greater degree of control is obtained and the exact amount of blood is known. In comparison with these methods in which large receptacles are used for the transfusion of blood it has the advantage that the blood may be introduced slowly, intermittently, and in very small quantities, while in the large receptacles the apparatus is less easily manipulated and if clotting occurs a great part of the blood may be lost. Most certainly in hæmorrhagic disease which of course occurs only in young infants, its ease of application should recommend it as the method of choice.

The following is a brief synopsis of the series: In all there were fourteen cases with thirteen recoveries or a mortality of but 8·2 per cent. which might be considered most encouraging when one takes into consideration that of the fourteen cases nine were considered to be almost moribund or completely exsanguinated. The one fatal case was an infant three days old, weighing four pounds, suffering from multiple and extensive subcutaneous hæmorrhages, since the first day of birth. On examination the child was found to be well nourished but dehydrated and covered with extensive extravasations of blood. The infant was immediately transfused with 160 c.c. of father's blood and two hours later succumbed to a mechanical death, the symptoms being dyspnœa, aphonia and cyanosis. Autopsy revealed overdistension of the right heart, rupture of the lung capillaries and bloody fluid in the pleural cavity. Here it will be observed the amount of blood given was approximately 20 c.c. to the kilogram or a little over twice the usual amount. The patient we feel would have been saved had a smaller amount of blood been injected.

The following facts will serve to illustrate the type of case we had to deal with better than a synopsis of each case. Twelve suffered from gastro-intestinal hæmorrhage and two from extensive subcutaneous extravasations. The average duration of hæmorrhages was two and one half days. Nine were prostrated or almost completely exsanguinated, the lowest weight was four pounds and the average weight seven pounds two ounces. The lowest blood count was 10 per cent. hæmoglobin and 900,000 red cells, the highest hæmoglobin being 65 per cent. The average amount transfused was 88 c.c. or approximately 13 c.c. per pound of body

weight; probably 15 c.c. per pound of body weight would be a good average.

The benefical effect of transfusion is immediate—it stops the bleeding, restores the lost blood, and transforms a sick and often dying child into a normal healthy infant.

The following more detailed description illustrates the usual course of events.

Case. 1. Age one and a half days; admitted for intestinal hæmorrhage, since twelve hours after birth. The family physician stated that the "infant must have lost six ounces of blood". Within three hours after admission the infant passed three large bloody motions. Tranfused three hours after admission, 90 c.c. of father's blood being injected. The red cells were 2,400,000 before transfusion, 4,700,000 directly after transfusion, and 6,400,000 fourteen hours later, showing the stimulating effect of the injected blood. Discharged the following day. Two months later the red blood cells were 4,800,000. Following transfusion another stool was passed showing no macroscopic blood.

Remarks

Transfusion is a safe and not complicated procedure and is to be recommended as the procedure in all cases of hæmorrhage of the newborn, for so far we are unable to judge the rapidity of hæmorrhage, and death has been known to take place in three hours following large extravasations. Other methods recommended may stop the hæmorrhage but they do not give the infant the same chance for immediate progress.

The danger from hæmolysis is overrated, and the injection of small air bubbles in our experience has created no ill effects.

Fifteen cubic centimetres per pound of body weight may be considered a safe amount to inject, which will approximately restore the amount of lost blood and stop the hæmorrhage.

In conclusion I wish to extend my thanks and appreciation to Drs. McKilwraith, Noble, and Hanley of Toronto who kindly referred the cases to me.

Case Reports

PRURITIS IN ORAL SEPSIS

By Dr. G. W. Smith,

North Bay, Ont.

SHORTLY before Christmas of last year, I was consulted by a gentleman whose sole complaint was of an itching in the skin. The itching would occur on any portion of the body, but was generally worst on the flexor surfaces of the upper and lower extremities and across the chest. It might occur any time during the day but was invariably worse when undressing at night and after getting in to bed. He was a commercial traveller by occupation, and while his home was in one of our larger cities, his territory lay within Northern Ontario. He could scarcely sleep at night, and in almost every place where he would stop over night he would have to go to a local physician to try to obtain something to enable him to sleep. He had followed out various lines of treatment without improvement. He called at my office one evening on his usual errand to get something to make him sleep. The most careful examination of the skin did not disclose any lesions except those produced by scratching, he was most particular about his person and his clothes. Did not use liquors or drugs, but did use tobacco moderately. The urine did not show sugar or albumen. I had about despaired of diagnosing his case until I examined the mouth, here was found a most septic condition, several roots and several teeth in various stages of decay, and the gums everywhere in a septic state. For one who was so particular in other ways it was rather disappointing to find the mouth and teeth so neglected. I advised him to consult his dentist upon returning home for his Christmas holidays, and in the meantime prescribed an antiseptic mouth wash and spoke to him of the necessity of keeping his teeth in a better condition. About two months afterwards he returned on his rounds and called me up on the telephone to say he was completely cured. Asked what treatment he had taken he replied none but what I had advised. A number of roots and teeth had

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been extracted and he had followed faithfully the directions to keep the mouth clean. Here then is a case of pruritus due apparently to an absorption of septic material from the mouth, some septic matter being no doubt in part absorbed directly from the gums and more in all probability swallowed with the food, producing an altered condition of the blood manifesting itself by a general pruritus. In view of the attention which oral sepsis is attracting in our day it appeared to me that this case would add to the numbers already accumulating to show the importance of this condition.

A TRAINING school for nurses is to be established at the Vancouver General Hospital. A committee was appointed at a recent meeting of the board of directors to draft the rules and regulations and the following members of the board of management were elected: Messrs. J. J. Banfield, G. H. Cottrell, and H. T. Devine, representing the hospital executive board; Dr. C. H. Gatewood, house committee; Dr. J. M. Pearson, representing the medical profession of the city; the general superintendent, the lady superintendent, and the managing secretary of the hospital.

Editorial

THE SURGICAL ASPECTS OF THE CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS

THE triennial gathering of the several societies of surgeons, physicians, and specialists at Washington has grown to be regarded as a great institution. This large joint meeting has become, especially in recent years, a pronounced success. The several societies, both in their individual and joint meetings, act and interact upon one another, and in this interaction derive mutual stimulus and fellowship.

The American Surgical Association is one of the most active associations. The papers presented at each meeting reflect the progress made during the year preceding and in a measure forecast the advancements to be anticipated.

The last annual meeting held in Washington was no exception to the rule. The papers were prepared with unusual care and in many cases marked milestones in the advancement of surgery in America.

To the writer there were three distinct features that gave it a special character and by which it will always be remembered.

The address of the president, Dr. Robert G. Leconte, was very largely devoted to the great subject of preparedness. It was a clarion call to the profession of the United States to greater interest and immediate action in preparing by organization for efficient medical service in the army and navy. He made the startling statement that in the Spanish-American War a soldier's life was ten times safer in the firing line than in the training camps. He proceeded to demonstrate the value to the country, and to the army and navy the importance of a competent and highly trained army medical service. He

urged upon the members the value of scientific medicine in the army and navy.

The address was received with great enthusiasm and indications of approval.

The second distinctive feature was the number of papers dealing with wounds and their treatment. Added interest was contributed to the discussion by some of the veterans of the Civil War, notably Dr. Keen, Dr. Mears and Dr. Van de Veer. The newer pathology, bacteriology and the present principle governing the treatment of wounds were contrasted with the ideas and theories that obtained half a century ago. The discussion brought very clearly into light the progress achieved by surgery during the past fifty years.

The third was a striking and sad feature, viz., the absence of overseas surgeons. At these annual meetings there have usually been several representative surgeons from England and Scotland, France, Italy, and the enemy and neutral countries who have brought with them the latest thought of the older civilizations and contributed in no small degree to the interest of the meeting. A day dreamer could not but wonder when, if ever, the kindly and friendly international fellowship of surgeons that obtained prior to the war would be resumed.

The relation of surgery to war was never more intimate, and never more intelligently appreciated both by the combatant and the non-combatant.

The meeting of the American Gynecological Society was certainly one of the best held in recent years. The papers presented were of exceptional quality.

The outstanding feature was the symposium on Syphilis. For the first time in its history the society introduced the plan of publishing before the meeting a full text on the main papers presented at this symposium. These papers or *referats* were bound together and were issued to the members of the society a month before the meeting. In this way it was possible for every member of the society to acquaint himself

beforehand with the actual paper of the symposium; he could accordingly collate his own clinical material, crystallize his experience, before he attended the meeting. At the meeting these papers were not presented in full. Instead their respective authors simply reviewed them in a short fifteen-minute address.

These papers were all of marked excellence. The one, perhaps, of most general interest was that of Sigmund Pollitzer, of New York City, on "Syphilis in relation to some social problems". The study of "Syphilis of the internal genital organs of the female", by George Gellhorn and Hugo Ehrenfest will remain for many years a monograph on the subject.

The marked feature of the experiment was the great improvement in the subsequent discussion. It was really a matter of astonishment to hear over and over again how much a speaker would say in his allotted five minutes.

The concensus of opinion seemed to be that the experiment of the published *referat* would be continued.

A second symposium was held on Uterine Cancer and its Treatment. The picture of uterine cancer as it was painted was certainly sombre enough. An animated discussion centred round the use of low heat as advocated by Percy. The exponents of this method, in the opinion of the writer, failed to make good their claim for the method as a curative agent. We are, I think, rather to regard it as a palliative method, certainly in cases that are at all advanced. Moreover, the method was shown to be not without its dangers.

More and more emphatic became the pronouncement that our only hope in the successful treatment of uterine cancer is in the early recognition of the disease. The disease once recognized is to be completely removed; preferably, perhaps, by the hot knife, as advocated long ago by Byrne, and lately re-emphasized by Werder and Boldt.

The question of prophylaxis in the matter of relief of irritation and repairs of lacerations was rightly enough given distinct prominence.

THE LANGE COLLOIDAL GOLD TEST

SINCE the publication, in 1912, of Lange's work on the precipitation of colloidal gold by proteids, in the presence of a weak solution of an electrolyte like sodium chloride, and his application of the method to the study of the cerebro-spinal fluid in syphilis, several articles have appeared on the value of the test in syphilis of the nervous system. From the investigations of Lange, Grulee and Moody, Lee and Hinton, and others we now know that the goldsol test is a reliable confirmatory test in the diagnosis of general paralysis, and that it is of greater value than the Wassermann test, applied to the cerebro-spinal fluid, in the diagnosis of tabes. We must not infer from this that the test is to be employed to the exclusion of other methods of investigation of spinal fluid in syphilis. It is a valuable addition to the laboratory methods of the serologist, because of its delicacy and the sharpness of its reactions. Little material is needed for the test.

Too much emphasis cannot be laid on absolute cleanliness in performing the test, and the method of Lange, as described by Grulee and Moody, should be faithfully followed. Moreover, as emphasized by Ramsay and Fidlar in their article in this issue, the sensitiveness of the colloidal gold should be previously tested against cerebro-spinal fluid from a case of general paralysis, before employing the reagent in actual tests.

The value of the Lange test, as an indication of the efficacy of treatment, is undoubted.

THE CANADIAN RED CROSS SOCIETY

IN the eighth annual report of the proceedings of the Canadian Red Cross Society the work of the year 1915 is divided into three sections,—the work in Canada, the work in England, and the active assistance given by the society

in the several war zones through its commissioners in coöperation with the British Red Cross Society.

Three hundred branches of the Society have been established during the year under consideration, making the total number of branches four hundred and eighty-four. A large number of auxiliary societies have also been founded in places where the population is too small to warrant the establishment of regular branches of the society. With a view to encouraging the formation of such branches organizers and speakers have been sent to rural districts to explain the objects of the Society and their efforts have proved most successful. The enormous correspondence entailed by the establishment of so many centres of activity has been reduced to some extent by the publication of a monthly bulletin containing information and instruction on matters relating to the work of the Society, and by the distribution of pamphlets entitled "Suggestions for work", of which about two hundred thousand copies have been sent out, and "War work".

An information bureau has been established by Mr. Hugh Langton, the librarian of Toronto University, for the purpose of answering enquiries as to the condition and progress of disabled Canadian soldiers.

In England, the Duchess of Connaught Canadian Red Cross Hospital has been established at Cliveden and provides accommodation for nine hundred patients; it is under the command of Colonel Gorrell, C.A.M.C., of Ottawa. The King's Canadian Red Cross Hospital at Bushey Park has accommodation for three hundred patients, and the Peak Hydro, at Buxton, Derbyshire, has been taken over by the Society, and converted into the Canadian Medical Services Special Hospital for Rheumatism. In addition the Daughters of the Empire Canadian Red Cross Hospital has been opened at Hyde Park Place, London, for the reception of Canadian officers and has accommodation for about forty patients. The cost of equipment and necessary alterations for this hospital was borne by Colonel and Mrs. Gooderham, of Toronto,

and its maintenance has been undertaken by the Canadian Militia Department.

The Society has given material assistance to a number of hospitals and other institutions in England and France and to the military hospitals established in this country.

Since November, 1914, Colonel C. A. Hodgetts, C.A.M.C., of Toronto, has acted as Commissioner to the Society in England. The position of the Society in France has been clearly defined as a branch of the British Red Cross Society and the work there has been under the direction of the Assistant Commissioner, Captain H. W. Blaylock, assisted by Captain G. W. Bridges. Most of the supplies are kept at Boulogne, but advanced depots have been established with each of the Canadian General Hospitals. During the year seventy-eight Red Cross nurses were sent to England by the Society and are now on duty in various hospitals in England, France, and the Mediterranean; and from November, 1914, to the end of 1915, no less than fifty-six ambulances were placed at the disposition of the Canadian Army Medical Corps. The splendid work accomplished by Lady Drummond in collecting information about wounded and invalided Canadian soldiers is well known. The Prisoners of War Department, which is under the direction of Mrs. Rivers Bulkeley, is an outgrowth of the Information Department. Weekly parcels of bread, and fortnightly parcels of other food, and clothes as required, are sent to each prisoner and if no special funds are available for this purpose, the general funds of the Red Cross are used to defray the expenses.

Mr. T. B. Kidner, vocational secretary of the Military Hospitals Commission, recently made a tour through the western provinces to organize vocational training for returned soldiers who are unable to resume their former occupations. Vocational officers have been appointed in Manitoba, Saskatchewan, Alberta, and British Columbia, and the services

of technical educational experts have been secured in each province. Arrangements have been made for instruction in general subjects, arts and crafts, at the convalescent homes at Winnipeg, Regina, Calgary, and Victoria. The people of Edmonton are very desirous of having a convalescent home established there. The matter was brought up at a dinner given on May 31st, in honour of Dr. W. Boyd, R.A.M.C., professor of pathology in the University of Manitoba, Captain H. L. Collins, C.A.M.C., and Captain Evan Greene, C.A.M.C., who have returned from the front. The following resolution was passed on the motion of Captain Collins, seconded by Dr. T. H. Whitelaw: "That in the opinion of the members of the Academy of Medicine here assembled it is necessary and essential that an "Open Unit" or casualty assembly corps be established in Edmonton for taking care of wounded soldiers from overseas and also of men awaiting discharge from the units in Alberta." The president of the Academy, Dr. Edgar Allin, paid a tribute to those members of the profession—35 in number—who have gone to the front from the province of Alberta, mentioning particularly the late Captain Monkman, C.A.M.C., who was killed in action last December.

The case report published on page 724 of this issue shows the close connexion that exists between general health and the condition of the mouth and teeth, and as this becomes more generally understood, more attention is being paid to the condition of the teeth of children attending the public schools. Some kind of inspection is now made in most schools, but Toronto seems to have been the first place in this country to establish a dental clinic. The combined efforts of the Oral Hygiene Committee of Toronto Dentists and the Ontario Dental Society resulted in the appointment of one dental surgeon four years ago. To-day there are fifteen centres with a dentist in charge of each, and, as a consequence

of the work accomplished at these clinics, the number of dental defectives found amongst 49,081 children examined has fallen from 95 to 65 per cent. The importance of keeping the mouth clean is impressed upon the children, who are taught to wash the mouth out well with water and to expel the water through the teeth. Marks are given for clean mouths and a spirit of competition is encouraged; and the interest of the children is awakened by the exhibition of slides and plaster casts to show malformation of teeth and jaws caused by neglect.

In New York it has been decided to employ dental nurses, whose duty it will be to remove lime deposits, accretions, and stains from the exposed surfaces of the teeth. The work will be done in the schools, in the office of a licensed dentist, or in any public institution , but only under the supervision of a qualified dentist. In order to prevent untrained persons from following the calling of dental hygienist, a bill was recently passed by the Legislature to provide for the establishment at any dental dispensary or infirmary legally incorporated and registered, and maintaining a proper standard and equipment, of a course of study in oral hygiene for women students. The course will cover one year's study, at the end of which time students will graduate as dental hygienists. Similar laws have been passed in Massachusetts and Connecticut.

The second bulletin of the Military Hospitals Commission has now been issued. It contains a list of the Convalescent Hospitals established in various parts of the Dominion and an account of the work of the Provincial Commissions, together with the personnel. Explanatory charts are appended showing the exact procedure from the battlefield to final rehabilitation in Canada of wounded and invalided members of the Canadian Expeditionary Force. A special orthopædic centre has been established in Toronto and all those who require artificial limbs are sent there direct from the port of disembarkation. A workshop for the manufacture

of artificial limbs will be established shortly, and it is proposed, as far as possible, to utilize the services of returned men in the manufacture of these limbs. By undertaking the manufacture of artificial limbs the Commission will be able to make use of the latest improvements, some of which would not be available to individual firms. Fortunately, very few Canadian soldiers have become totally blind, four only having returned to Canada up to June 16th, last. Those who have lost their sight are first given instruction at the St. Dunstan's Home for Blinded Soldiers, London, and after a period of training return to Canada. Arrangements have been made with the Canadian Free Library for the Blind to furnish books and other literature to these men and, if necessary, on arrival in Canada they will be sent for further treatment to one of the Blind Institutes already established in this country. Those who have lost an eye are provided with a glass eye by the Canadian medical authorities in England.

Dr. A. Thompson, member of Parliament for the Yukon, has been appointed medical superintendent of the Commission, with the military rank of Lieutenant-Colonel, and the following gentlemen have been added to the personnel of the Commission, Dr. Francis J. Shepherd, of Montreal; F. W. Peters, Esq., of Vancouver, and Robert Gill, Esq., of Ottawa.

Arrangements have been made for the training of members of the Expeditionary Force who are unable, through disability, to resume their former occupations, and classes have been commenced at some of the Convalescent Homes where instruction is given in penmanship, business English, practical arithmetic, mechanical drawing, woodworking, correspondence, and, in a few special instances, steam engineering and automobile engineering. The following vocational officers have been appointed: Quebec and the Maritime Provinces,—Mr. F. H. Sexton, director of technical education for Nova Scotia; Manitoba,—Mr. J. C. Warters, director of technical education for Winnipeg; Alberta,—Mr. J. C. Miller, director of technical education for Alberta; British Columbia,—Mr. John Kyle, organizer of technical education

for British Columbia; Saskatchewan,—Mr. H. W. Hewitt, supervisor of manual arts, Saskatoon.

Professor Lannelongue, of the Paris College of Medicine, laid before the Senate, in 1910, a Bill directed against depopulation, which led to a governmental study of the question. A report by M. E. Henry, a member of the *Chambre de Commerce*, has now been made public. It states that during the period from 1903 to 1913 the number of births was slightly in excess of the number of deaths with exception of the year 1907 when the excess of deaths was about 19,071, and the year 1911 when the deaths exceeded the births by 34,869. In the year 1903 the number of births exceeded the number of deaths by 73,016. The war has made only too apparent the great importance of this matter, particularly when one remembers that in Germany the excess of births over deaths varies from 740,000 to 910,000, and in Austria from 237,000 to 342,000. The conclusions of the report prepared by M. Henry have been adopted by the *Chambre de Commerce* and are as follow: that the resources of literature, art, and the press be utilized to inform the nation of the grave peril which the lowering of the birth rate produces in France and to encourage ideas and customs necessary to combat this lowered birth rate; that parliament introduce as soon as possible, the judicial, administrative, fiscal, and financial reforms necessary to check depopulation and especially that the various problems outlined to the Senate in Professor Lannelongue's report be studied and the remedies applied without delay; that the laws on the employment of apprentices in shops where adults are employed be revised; that a study be made of measures to combat alcoholism, and the necessary laws passed; that the aid given to large families cease to be regarded as charity and be sufficiently increased to be a substantial encouragement to those who have added to the riches of the country by building up families.

In the report submitted by Professor Lannelongue in 1910, the following were mentioned as the principal reasons

for the reduction in the number of births: prolonged or perpetual celibacy, late marriage, the excessive tendency to seek official life, the lack of testamentary liberty, the precarious situation of the salaried official, rural emigration. As remedial measures, Dr. Lannelongue proposed that supplementary military obligations should be laid upon celibates of more than twenty-nine years of age; that marriage should be required of all civil officials above the age of twenty-five years; that civil employees who have not less than three living children should be given certain pecuniary advantages, both during service and upon retirement; and that a father of a family should have absolute liberty in disposing of his patrimony.

Some idea of the effects of the war upon the birth rate of France will be gathered from the following figures, quoted in a recent issue of the *British Medical Journal.* During 1914, the number of infants eligible for vaccination within a certain area in France was 104; in 1915, in the same area, the number was 57, and in 1916 only 32. The birth rate in one town fell from 173 in 1913 to 86 in 1915. Basing calculations upon these figures and taking the annual birth rate of France as 775,000, the decrease in the number of births this year would be not less than 541,000. To this must be added the loss of life on the battlefield and the increased death rate among the civil population caused by unfavourable conditions, such as under-nourishment of infants, lack of medical attention and overwork amongst women.

The effects of the war upon the population of England were discussed at a meeting of the Royal Statistical Society on May 16th, when Mr. J. W. Nixon stated that the death rate in England had not as yet been very seriously affected, that the theory advanced early in the war that the proportion of male births had been increased was found to be groundless, and that the natural increase of population had fallen from 377,000 in 1913 to 252,000 in 1915 exclusive of deaths of soldiers abroad.

A TELEGRAM has been received by Mr. A. B. Wiswell, of Halifax, informing him that his son Captain Gordon Wiswell, M.D., C.M., has been awarded the Military Cross.

Captain Wiswell attended to the wounded in the recent fighting in France for five days and nights without sleep and with almost no food, all the time within the range of shells and machine guns. He came through this dreadful ordeal unwounded.

Gordon Wiswell, who is a graduate in Arts and in Medicine, of Dalhousie University, was a noted athlete in his time, equally proficient as a football player and a player of ice-hockey.

It is understood that Captain Wiswell will be decorated by His Majesty personally.

THE joint committee representing Dalhousie University and the Nova Scotia Medical Society upon the Copwell Library and Library of the Faculty of Medicine of Dalhousie University held its first meeting on July 13th.

It was decided to proceed at once with the classifying of the books and the preparation of a catalogue. A librarian has already begun work. The committee has sent out a request addressed to all the medical practitioners in Nova Scotia for gifts of books, manuscripts, old and rare texts, documents bearing on the history of the profession, portraits and photographs of noted physicians, or any object which should have a place in a medical library. Gifts from any alumini of Dalhousie University will be very much appreciated.

Miscellany

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

Manual of Operative Surgery. By John Fairbairn Binnie, A.M., C.M., F.A.C.S., surgeon of the Christian Church, the German and the General hospitals, Kansas City. Seventh edition, revised and enlarged. 1,363 pages with 1,597 illustrations. Publishers: P. Blakiston's Son & Company, 1012 Walnut Street, Philadelphia. Price, $7.50 net.

The Pathology of Tumours. By E. H. Kettle, M.D., B.S., assistant pathologist, St. Mary's Hospital. 224 pages with 126 illustrations. Publishers: H. K. Lewis & Company, Limited, 136 Gower Street, London, W.C., 1916. Price, 10s. 6d. net.

Annales de la Clinique Chirurgicale du Professeur Pierre Delbet. No. 4, Le Thorax et L'Emphyseme La Chondrectomie. Par Eugene Douay, aide d'anatomie à la Faculté de médecine de Paris. Avec 111 figures dans le texte. Paris, Librairie Félix Alcan, 108 Boulevard Saint-Germain, 1914. Prix: 20 francs.

A Text-Book of Fractures and Dislocations, With Special Reference to Their Pathology, Diagnosis and Treatment. By Kellogg Speed, S.B., M.D., F.A.C.S., associate in surgery, Northwestern University Medical School; associate surgeon, Mercy Hospital; attending surgeon, Cook County and Provident Hospitals, Chicago, Ill. Octavo, 888 pages, with 656 engravings. Cloth, $6.00, net. Lea & Febiger, publishers, Philadelphia and New York, 1916.

THE MORTALITY FROM CANCER THROUGHOUT THE WORLD. By FREDERICK L. HOFFMAN, LL.D., F.S.S., F.A.S.A., statistician to the Prudential Insurance Company of America. Newark, New Jersey: The Prudential Press, 1915.

LATERAL CURVATURE OF THE SPINE AND ROUND SHOULDERS. By ROBERT W. LOVETT, M.D. Third edition, revised and enlarged. 213 pages, with 180 illustrations. Publishers: Blakiston's Son & Company, 1012 Walnut Street, Philadelphia, 1916. Price, $1.75 net.,

BLOOD-PRESSURE: ITS CLINICAL APPLICATIONS. Second edition, revised and enlarged. By GEORGE W. NORRIS, A.B., M.D., assistant professor of Medicine in the University of Pennsylvania; visiting physician to the Pennsylvania Hospital; assistant visiting physician to the University Hospital; Fellow of the College of Physicians of Philadelphia. Octavo, 424 pages, with 102 engravings and 1 coloured plate. Cloth, $3.00 net. Lea & Febiger, publishers, Philadelphia and New York, 1916.

Res Judicatæ

CAN WE KEEP TONSILS AND ADENOIDS FROM BECOMING DISEASED?

AS an explanation as to why such a subject should come before Medical Officers of Health, I beg to submit that at present the mouth and upper respiratory tracts are suspected of being implicated in causing the greater number of diseases we suffer from—ninety per cent. of ear cases, adenitis, rheumatism, endocarditis, tuberculosis, et cetera. If some one will explain how this can be prevented it surely will improve the public health.

I selected one Windsor school of four hundred and sixty-seven pupils between the ages of five and fourteen and analysed the reports made by the school nurse. Only fourteen per cent. were free from diseased teeth and tonsils. Thirty-five per cent. had

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diseased tonsils and adenoids. Sixty-three per cent. had diseased teeth. Fourteen per cent. had diseased tonsils and healthy teeth, three fourths of them over ten years of age. Twenty-one per cent. had diseased tonsils and diseased teeth, half of them over ten years of age. Thirty-seven per cent. had enlarged cervical glands and of these twenty per cent. had normal tonsils and teeth; fifty per cent. had normal tonsils and diseased teeth; ten per cent. had diseased tonsils and normal teeth; twenty per cent. had diseased tonsils and teeth.

If we believe that tissues are present because they are of some use, then we must conclude that some very prevalent mistake in our mode of living favours the occurrence of tonsillitis. Why have so many children diseased tonsils? If we knew what was wrong then we might think of a way to prevent it. This suggests the question of what use are tonsils? Physiologists give us no satisfactory answer. They appear about the fourth month of intrauterine life and atrophy about ten years years of age. They are composed of adenoid and connective tissues and produce lymphocytes. It is believed that their activity ceases about ten years of age and as puberty is reached about this time it has been suggested that there is an internal secretion that has to do with sexual development, but their early removal does not seem to injure development in any way. The faucial tonsils are shut off from the respiratory tract by the posterior pillars so that they are really in the digestive tract and are considered by some as digestive organs, but laboratory experiments do not bear this out for we cannot extract a digestive. That they arrest and destroy bacteria of disease seems certain, but lymphocytes only become phagocytes after the action of the opsonins produced by the eosinophiles, and there is an abundance of lymphocyte-forming tissues elsewhere. At birth the roof of the mouth almost touches the orbit and the development of the bones of the face with their sinuses occurs during the first ten years of life so that it has been suggested that these glands have to do with the catabolism of this process and that is why they atrophy at ten years. Colouring matter injected into the floor of the nose finds its way into the tonsils. In this view the tonsils are simply a part of the lymphatic system, with afferent and efferent vessels draining the nose and sinuses. This is very simple and plausible, but it does not explain why there should be such an aggregation of adenoid tissue in this particular place and it is not in accord with our usual anatomical teaching. Thus we may not be sure of their function, but no doubt they are present for some good purpose, and if we do not know what it is, it is no fault of the tonsils.

Nor are we more certain why they become so often diseased. If they are only lymphatic glands then the infection comes along the afferent vessels from a midus in the area drained by them and they become dangerous, like choked filters. When some tissues are prone to disease it is customary to say that these tissues are vestiges of developmental structures without function in man and disappearing, hence particularly vulnerable. It is true the tonsils are developed from the second visceral arch, but the organs of hearing are developed from the first, and they certainly are not functionless. It is likely the tonsils aid in growth only, and are vulnerable, like the temporary teeth when their work is done.

The commonly accepted view is that infection comes from the mucous surface, the crypts harbour overwhelming numbers of bacteria that produce repeated inflammations with hypertrophy and dangerous nests of the invaders. It has been claimed by a very eminent authority that our overheated dry rooms in winter so irritate the pituitary gland that its influence causes nasal and tonsillar hypertrophies. I do not see why an irritated pituitary should act this way, but I can easily see why the nasal and pharyngeal tissues will be congested in trying to furnish moisture to overheated dry air.

The story of diseased tonsils and adenoids would seem to be this: at birth the infant has tonsils developing rapidly and is exposed to the overheated dry air of the house. Through the pituitary gland or by their efforts to produce humidity the tonsils become hypertrophied while they are already busy eliminating the products of catabolism from the developing sinuses. Now the baby is given a rubber comfort to keep him quiet and this is so filthy that he eats his peck of dirt before he gets a fair start. If there are any kind of diseased germs anywhere about him he surely is likely to absorb them. I have been told that where babies gather together, kind mothers pass the comfort from baby to baby as occasion requires. Nor is the feeding of bacteria the worst thing the comfort does, it arches the roof of the mouth, lessens the capacity of his nares, crumples the cartilaginous septum against the turbinates, obstructing respiration and drainage. Sucking narrows at the same time the soft cartilaginous arches and deforms the teeth. Thumb sucking is the common cause of "buck teeth". Baby gets teeth but unlike his animal friends his teeth become dirty and carious, while infected gums, through the lymphatics or more likely directly through the crypts, assail the tonsils with virulent bacteria. To overcome this the tonsils become congested

and hypertrophied, but continually repeated attacks eventually overcome the valiant lymphocytes and the trenches are entered by the germs which destroy the tissues that support them and make the unhappy tonsil a base for attacks upon the ears, glands, serous surface, and other vital points.

There is no other source of tonsillar infection that can compare with that from the teeth. Yet perhaps at the same time the blocked nose cannot drain properly and germs are absorbed from the nares and sinuses.

Food is so cooked and is of such a nature that chewing is unnecessary, hence the jaws are not sufficiently developed and broadened out. This aids in over arching the palate, and bending the septum as well as in cramping the incoming permanent teeth. Gum chewing, at this period of life, I think is helpful. When five years old he is sent to school, where the air is even hotter and drier than at home, where the teacher's idea of sanitation is to open the window occasionally and the cold draft makes the boy's carious teeth ache. These are pulled out before their time and as a result the permanent teeth come in irregular, overcrowded, and doomed to decay—to infect still further the tonsils even in adolescence. The tonsils and milk teeth live and die together, and when we have solved the cause of carious teeth the problem of tonsil infection will be a small one.

To prevent the disease of tonsils—

1. The air of our homes and schools should be kept at a proper humidity.

2. Every school room should have a hygrometer as well as a thermometer.

3. Baby comforts should be abolished.

4. Proper food properly chewed would perhaps avoid caries of the teeth, but in the meantime;

5. Healthy milk teeth should be kept healthy by cleanliness, and decayed milk teeth should be cared for at once by a dentist.

6. During the milk teeth period the chewing of a hard gum fifteen minutes after meals would be helpful.

7. If nasal obstruction has occurred or any of the tonsillar tissues have become infected they should be attended to at once by a competent surgeon.

8. Any tonsil that is not atrophied at ten years of age is abnormal and should get proper treatment at once.

Windsor, Ontario. G. R. Cruickshank.

Obituary

A NOTICE of the death of the late Lieutenant-Colonel A. W. Tanner, C.A.M.C., of Moosomin, Saskatchewan, appeared in the last issue of this JOURNAL. The *British Medical Journal* writes: "Lieutenant-Colonel A. W. Tanner, commanding the 10th Canadian Field Ambulance, died from wounds received on June 3rd. He was born at Watford, Ontario, in December, 1875, graduated at Toronto University in 1899, and settled in practice in Moosomin, Saskatchewan. There he rapidly made his mark as a general practitioner and most capable surgeon. In 1910 he joined the 16th Canadian Light Horse, allied with the 16th (the Queen's) Lancers, and within a month of the beginning of the war was given his lieutenancy in this brigade. From being a combatant officer he transferred to the C.A.M.C. and last year was appointed A.D.M.S. of the 10th Canadian Military District, which included the provinces of Manitoba and Saskatchewan. As such he was in medical charge of the Sewell camp in Manitoba, and later was largely instrumental in bringing together and establishing the 10th Field Ambulance. This unit arrived in England on March 13th, 1916, and within a month was at work at the front. Here Colonel Tanner immediately impressed all with whom he came into contact as a most capable officer with administrative abilities of the first order. His death is a very distinct loss to the Canadian Army Medical Service."

Surgeon-General Carleton Jones, D.M.S., Canadian Expeditionary Force, writes: "Lieutenant-Colonel Tanner I have only known a short time, since he joined the Expeditionary Force in England, but from what I saw of his work in England and in France, I was particularly struck with his natural ability for military medical work. I feel his loss very much, as it means that the service is deprived of a most capable and useful officer."

DR. T. W. VARDON, of Galt, Ontario, died of heart failure on June 30th, being taken ill suddenly while playing a round of golf. Although in the seventy-fifth year of his age, Dr. Vardon continued his professional duties to the day of his death. He had practised in Galt for thirty years, and had earned the respect and

affection of all classes of the community. Thomas Wyre Vardon was born in Pickering Township, a few miles east of Toronto. He graduated at Victoria College, Toronto, in 1866, and went into practice at Cornibus, now Markdale, for two years. From there he went to Hawkesville, North Waterloo, where he practised for eighteen years, and in February, 1886, removed to Galt. He was medical officer of health at Galt for sixteen years, and for eight years was a member of the Ontario Medical Council. At the time of his death he was a member of the Executive of the Provincial Board of Health. Besides being a trusted and popular physician he was an eloquent speaker and a keen sportsman.

Dr. Thomas Henderson, of Detroit, Michigan, died July 4th. Dr. Henderson was born in Exeter, Ontario, in 1855.

Dr. J. F. Mather, who practised for a number of years in Belleville, Ontario, died at Long Beach, California, on June 30th.

Dr. Elizabeth C. Secord, of Farmeston, New Brunswick, died July 4th, in the seventy-third year of her age. Dr. Secord was the daughter of the late Daniel Smith, of Blissville, New Brunswick, and became the wife of the late John Secord, of Norton, in the same province. Left a widow, she entered upon the study of medicine at Keeokuk, Michigan; after graduation she spent some time in the London hospitals and did some post-graduate work at the University of Dublin, and in 1883 obtained a licence to practise in the province of New Brunswick. She was the first woman to practise in the province and settled at Fredericton Junction, then went to Norton, and finally to Farmeston where she continued to practise until a few months before her death.

Dr. Stuart Aird Ross died at Vancouver on July 9th. He was the son of the late Dr. W. D. Ross and graduated from McGill University in 1900. He was forty years of age and was in practice at Lytton, British Columbia.

News

MARITIME PROVINCES

Seven hundred and ninety-nine patients were admitted to the Moncton General Hospital during the year ending May 31st, 1916—559 private patients and 240 public patients. The number of patients discharged cured was 629, those improved 47, not improved 19, incurable 10. Seventeen patients were not treated and 45 died.

The annual meeting of the Board of Management of the Hazelwood Sanitarium, Halifax, was held on June 13th. During the year 43 patients were admitted, 18 were discharged, 15 showed improvement, and 9 were working. The treasurer's report showed a balance of $342.40 in favour of the sanitarium.

ONTARIO

The following cases of communicable disease were reported in the province during the month of June: smallpox, 44 cases; scarlet fever, 121 cases, 2 deaths; diphtheria, 165 cases, 17 deaths; measles, 2,039 cases, 14 deaths; whooping cough, 135 cases, 7 deaths; typhoid fever, 35 cases, 7 deaths; tuberculosis, 153 cases, 86 deaths; infantile paralysis, 2 cases, 1 death; cerebro-spinal meningitis, 11 cases, 9 deaths.

Dr. J. H. Radford has been appointed medical officer of health at Galt in succession to the late Dr. T. W. Vardon.

It has been decided not to enlarge the Orillia General Hospital at present, as the cost of the proposed alterations would be too great.

Several cases of a mild form of smallpox have been reported in the neighbourhood of Zion and Mull in Harwich Township.

The formal opening of the Port Hope Hospital took place on June 29th.

The by-law to grant the sum of $58,000 to the Brantford General Hospital has been passed, the votes being 469 for and 295 against it.

Dr. George C. Kidd, medical superintendent of the Cobourg Hospital for the Insane, has been appointed assistant medical superintendent of the Brockville Hospital for the Insane.

QUEBEC

An assistant physician is urgently required at the Mount Sinai Sanatorium for Incipient Tuberculosis, at Ste. Agathe des Monts. The position offers exceptional advantages for clinical work and scientific investigation and the remuneration offered for the first year is five hundred dollars. There are opportunities for advancement with a possibility of succeeding to the superintendency within a year. A licensed graduate of the Jewish faith would be preferred, especially one who has had some experience in the handling of tuberculous patients; a provincial licence is not absolutely essential. Applications should be addressed to Mount Sinai Sanatorium, Room 209, 591 St. Catherine Street West, Montreal.

The next meeting of the Association for the Prevention of Tuberculosis will be held at Quebec on the 11th and 12th of September.

The annual convention of the Canadian Public Health Association will take place at Quebec on the 12th, 13th, and 14th of September next.

BRITISH COLUMBIA

The new Kootenay Lake General Hospital, Nelson, is to be commenced at once.

The twenty-sixth annual meeting of the directors of the Provincial Royal Jubilee Hospital took place at Victoria on June 27th. The reports presented showed increased activity in every branch of the hospital work during the year in spite of the war and financial depression. The receipts for the year ending May 31st, 1916, amounted to $79,620.52 and the financial statement closed with a cash balance of $312.82. The admissions during the year

numbered 1,812, an increase of 254 over the previous year. The average cost of maintenance for each patient amounted to $1.86 a day; this is one cent a day less than last year and is the more noteworthy in view of the increased cost of living. A reduction of $2.50 a week has been made in the charges to private patients during the war. A maternity ward has been opened on the ground floor of the children's ward, as the funds raised by the Women's Auxiliary—$3,203.70, with the contribution of $380.97 from the Bachelor's Fund, were insufficient to build a new ward, and the hospital is now able to give student nurses instruction in maternity work. This naturally has increased the number of nurses and an addition to the Nurses' Home to accommodate thirty-five more nurses is urgently needed. The wards have been much overcrowded during the year and at times it was necessary to turn some of the private rooms into wards for public patients. In the earlier part of the year, great difficulty was experienced in securing assistance and for several periods Dr. Edward Hasell, the medical superintendent, was single handed. In November, Dr. E. C. McFarlane, of London, Ontario, accepted the position of house surgeon. It has been difficult also to retain the services of male nurses and orderlies, who have enlisted one after the other. In the report of the directors of the hospital, satisfaction was expressed concerning the recent comment of the grand jury on the crowded condition of the tubercular ward, as no public help has ever been received by the hospital towards the erection of new buildings. The plans have been prepared for the new ward, which will cost about $5,000 and the Victoria City Council has now made a grant of $2,500 towards this amount. The municipalities of South Saanich, Esquimalt, and Oak Bay have each promised $250, but no reply has been received as yet from the Provincial Government.

Dr. Morley, of Vancouver, has been appointed medical officer of health at Gloverdale in succession to Dr. Sinclair, who has left for overseas service.

MEDICAL COLLEGES

McGill University

A special convocation was held at McGill University on July 10th, when the degree of M.D., C.M. was conferred upon the following candidates, fourteen in number. These men accom-

panied the McGill Military Hospital to France and after eight months of service returned to Montreal. They were given a special course in order that they might complete their studies and return to the front. M. C. Abell, of Aylmer West, Ontario; C. K. Church, B.A., of Aylmer, Quebec; G. Lockhart Gall, B.A., of Lachute, Quebec; N. M. Guiou, of Ottawa; C. J. Kendall, of Ottawa; W. C. Lowry, B.A., of Lennoxville, Quebec; G. A. Lyons, of Moncton, New Brunswick; E. A. McCusker, of Regina, Saskatchewan; H. J. Mack, of Cornwall, Ontario; W. E. Ord, of Weston, Ontario; H. G. C. Paine, of St. Johns, Newfoundland; F. G. Pedley, B.A., of Montreal; R. F. Price, of Albert Bay, British Columbia; and L. C. Reid, of North Bay, Ontario.

The honour list follows: Honours in aggregate of all subjects of the year, N. M. Guiou, Ottawa. Honours in medicine and clinical medicine, N. M. Guiou, Ottawa. Honours in surgery and clinical surgery, N. M. Guiou, Ottawa. Honours in gynæcology, 1, N. M. Guiou; 2, E. A. McCusker and F. G. Pedley, B.A. Honours in ophthalmology, 1, F. G. Pedley, B.A.; 2, R. F. Price. Honours in oto-laryngology, 1, N. M. Guiou and R. F. Price; 2, M. C. Abell and F. G. Pedley, B.A.; 3, H. J. Mack. Honours in pathology, 1, N. M. Guiou, 2, F. G. Pedley, B.A.

Dalhousie University

Captain Frank Woodbury has recovered from his recent illness and is on duty again with the Dalhousie Military Hospital. While at Shorncliffe, the unit had charge of the administration of the Helena Hospital which was taken over by the Canadian Army Medical Corps as a hospital for Canadian officers. The work in connexion with this hospital was in charge of Major L. M. Murray, who was also supervisor of the medical division of the Shorncliffe Military Hospital.

Laval University

The following candidates have successfully passed the examinations and received their medical degree from Laval University, Montreal: Stanislas Choquette, Joseph Coallier, Ernest Gariepy, Desire Helie, Elphage Jacques, Leopold Lamoureux, Lionel Lamy, Albert La Roche, Armand Larose, Leo. Lavigne, Oscar Le Riche, Albert Levesque, Henri Mailloux, Rodolphe Michaud, Albert Poisson, Leonide Viens, Lucien Mackay.

ARMY MEDICAL SERVICES

A "Casualty Command" has been established by Order in Council as a regular branch of the Canadian Expeditionary Force. The command will be under the direction of the Military Hospitals Commission, and will have charge of all matters relating to returned convalescent soldiers. Units will be established in each military district in the Dominion, where all questions of pay, discipline, and medical attention will be administered so far as disabled soldiers who have returned from the front are concerned. The new command, it is understood, will be under the direction of Lieutenant-Colonel Sharples, of Quebec, who has been in charge of the depot for returned soldiers there. Up to the present, this work has been in charge partly of the Military Hospitals Commission and partly of the Militia Department; the new arrangement places the whole work under one authority. Mr. Scrammell, secretary of the Commission, recently stated that seven hundred returned soldiers had already been placed in convalescent hospitals and homes in addition to about one thousand out-patients, and that two hundred and fifty had been placed in sanitariums. A hospital for mental disorders and cases of shock among returned members of the Expeditionary Force has been established at Cobourg, Ontario, and has accommodation for about three hundred patients. Dr. Vrooman, assistant superintendnent of the Brockville Hospital for the Insane, has been appointed superintendent.

The following promotions are announced in the C.A.M.C. To be Colonel: Lieutenant-Colonel A. Migneault, of Montreal, commanding officer of the Canadian Hospitals at St. Cloud, Paris. To be temporary Colonel: Major F. McKelvey Bell, of Ottawa, acting deputy director of medical service. To be temporary Captain: Dr. J. H. Slater. To be temporary Lieutenant: Sergeant-Major McTaggart. To be Nursing Sisters: Misses M. Condon, G. L. Edgecombe, A. P. Gamblin, M. E. Lewin, F. M. Hocken, A. C. Craig, and C. Brunelle.

The Military Cross has been awarded to Lieutenant Peter McGibbon, C.A.M.C., of Bracebridge, Alberta.

It is announced by private advice that Private Manhire, of the Ninth Field Ambulance, has been awarded the D.C.M. for distinguished conduct in the field.

The following Lieutenants in the C.A.M.C. have been appointed temporary Lieutenants in the R.A.M.C.: H. S. McSorely, M.D.; G. H. Clement, M.B.; G. B. Archer, M.B.; B. W. Mosher, M.D.; P. Nase, M.D.; G. O Hutchinson, M.D.; E. E. Bryans, M.D.; T. J. Waddell, M.D., J. N. Lyons, M.D.; S. Rodin, M.D.; G. B. Ferguson, M.D.; W. A. Murray, M.D.; E. Fidlar, M.B.; E. L. Steele, M.D.; C. S. Tennant, M.B.; I. Vandandaigue, M.D.; J. W. Evans, M.D.; A. Mackinnon, M.B., and R. Stipe, M.B.

Lieutenant G. W. Whitman, of Stellarton, Nova Scotia, has been gazetted Captain in the R.A.M.C.

The safe arrival in England of No. 12 Field Ambulance (Winnipeg) and No. 13 Field Ambulance (Victoria) was announced on July 7th.

Dr. Eric K. Clarke and Dr. F. F. Tisdale, of the Toronto General Hospital, have joined the staff of a military hospital at Shorncliffe.

The following have been appointed medical officers of overseas battalions: Captain W. J. Goulds, of Brantford, Ontario, of the 111th Battalion; Captain H. K. Manning, of Toronto, of the 198th Battalion; Captain O. J. S. Little, of Seaforth, Ontario, of the 220th York Rangers; Captain Manchester, of the Royal Columbian Hospital, New Westminster, of the 131st Battalion.

The following doctors have joined the Royal Army Medical Corps: Dr. C. C. Fisette, of Brantford, Ontario; Dr. R. D. Ferguson, of Winnipeg.

Dr. A. C. Delacroix, assistant resident physician of the Willard Parker Hospital, New York, has joined the staff of the 237th American Legion Battalion at Halifax.

Captain L. D. Collin, of Winnipeg, has been promoted to the head of the surgical department of the Laval University Hospital with the rank of major. The hospital is now stationed at St. Cloud, near Paris.

Lieutenant-Colonel Carter, C.A.M.C., has been appointed medical officer at Niagara Camp. Captain Proctor, of Kingston, has been appointed medical officer at the Minnewaska Sanitarium.

Dr. Thomas E. Staton, formerly consulting physician at Guy's Hospital, London, has enlisted as a private in the Canadian Army Medical Corps. His eldest son was recently killed in action and his three other sons are serving with the colours.

Captain H. A. Hessian, C.A.M.C., of Vancouver, has left for service in Flanders. Dr. G. S. Gordon, of Vancouver, has also left for service overseas.

Captain Victor McWilliams, of Toronto, who has returned after a year's service with the R.A.M.C., has joined the C.A.M.C. and is now on the staff of the Training Depot at Camp Borden.

The following doctors have joined the C.A.M.C. for service overseas: Dr. J. F. Murphy, of Chicago; Dr. E. L. Madison, of Eau Clair, Wisconsin; Dr. Joseph E. Johnson, of Memphis, Tennessee; Dr. F. E. Fraser, of Jacksonville, Florida;

Captain Conrad G. Geggie, C.A.M.C., of Quebec, has been appointed medical officer of the New Brunswick Highland Battalion which is being recruited under Lieutenant-Colonel Percy A Guthrie. Captain Geggie, who is to be promoted to Major, went to the front with the First Canadian Division as an officer in the First Field Ambulance Corps and served with that unit at the battles of Neuve Chappelle and Ypres. After the battle of Ypres, Captain Geggie was transferred to the 10th Battalion then under the command of Colonel Guthrie, and took part in the battles of Festubert, Givenchy, Cuinchy and Messines. He was wounded and invalided to Canada, leaving England on the *Hesperian*. When the vessel was torpedoed, Captain Geggie carried Lieutenant-Colonel Guthrie, who was unable to walk up on deck and procured a life belt for him, and afterwards assisted in the rescue of a number of women and children, himself being one of the last to leave the ship. He is a graduate of Laval University.

Major W. H. Irvine, of Fredericton, New Brunswick, has joined the Field Ambulance Corps now in process of organization at St. John.

Captain Edwin Douglas, of Halifax, who left as regimental medical officer of the 40th Battalion, has been transferred to the staff of the Dalhousie Military Hospital which is now in France.

Captain J. F. James, of London, Ontario, has resigned his position as medical officer of the 149th Battalion.

The following is the nominal roll of officers of the West Cliff Canadian Eye and Ear Hospital at Folkestone, Kent:

Lieutenant-Colonel J. D. Courtenay, officer commanding; Lieutenant-Colonel S. H. McKee, C.M.G., second in command; Major A. B. Osborne, eye clinic; Majors W. J. Brown and H. W. DuHamel, ear and throat clinic; Captain P. G. Bell, registrar and adjutant; Captain H. D. Courtenay, medical officer; Captain J. P. Harrison, eye clinic; Captains S. J. McLennan and C. W. Waldron, ear, nose, and throat clinic; Hon. Lieutenant A. F. Marshall, quartermaster. Supernumerary: Captain J. W. Bell, Canadian Army Dental Corps, attached for duty. Our attention has been drawn to an error which appeared in the May number of the Journal, when it was stated that Lieutenant-Colonel Hanford McKee was the commandant of this hospital and that Lieutenant-Colonel P. Goldsmith was second in command. Lieutenant-Colonel Goldsmith is not attached to the West Cliff Hospital but is on the staff of the Duchess of Connaught Canadian Red Cross Hospital, Taplow.

No. 4 Canadian Stationary Hospital has been converted into a general hospital and is under the command of Lieutenant-Colonel Lebel. Colonel Mignault has been promoted to be senior officer commanding this unit and the Laval Military Hospital, both of which are now stationed at St. Cloud, near Paris.

CASUALTIES

Died of Wounds

Captain Blaine Haversom, R.A.M.C., of Carman, Manitoba. Captain Haversom was the son of Mr. John Haversom, a prominent lawyer of Carman, and was in the twenty-seventh year of his age. He was a graduate of Manitoba Medical College, and for a time was house surgeon in the Winnipeg General Hospital His death occurred on June 25th.

Prisoner of war

Captain W. R. W. Haight, C.A.M.C., of Toronto. The gallant stand made by Captain Haight is described in a letter written by a Canadian officer who took part in the Hooge battle: "Captain Haight, who was medical officer to the —— Battalion, was dressing wounded soldiers in the dressing station when the Huns swept up to the station, entered and bayonetted the sergeant and the men who were assisting him. Infuriated, Captain Haight grabbed his Colt revolver, backed up into a corner and accounted for several Huns before his revolver was empty. Then he fell, pierced by the bayonets of the cowardly assassins." It was feared at first that Captain Haight had been killed. Official reports, however, state that he has been taken prisoner.

Wounded

Captain N. Macleod, C.A.M.C.
Lieutenant Ernest Nivin, R.A.M.C.

Seriously ill

Nursing Sister Gertrude Muldrew, of St. Thomas, Ontario.
Nursing Sister Alberta B. Armstrong, of Trenton, Ontario.

A report was recently published by the Canadian Army Dental Corps for the period from July 15th, 1915, to March 31st, 1916. During this time, 201,610 dental operations were performed, including 66,079 extractions, 86,887 fillings, 15,304 treatments, 10,898 dentures, 10,710 prophylaxis treatments, 11,732 devitalizations.

Canadian Literature

Original Contributions

The Canadian Journal of Medicine and Surgery, July, 1916:

The Ontario Medical Association: President's Address	H. B. Anderson.
Motion study in surgery	F. B. Gilbreth.

The Canadian Practitioner and Review, July, 1916:

The treatment of the blind after the war	B. C. Bell.
The lost art in obstetrics	J. Hunter.
Cerebro-spinal meningitis in Ontario	J. G. Fitzgerald.

The Public Health Journal, June, 1916:

Sewage disposal by the activated sludge process	T. Chalkley Hatton.
Presidential address, Ontario Medical Association	H. B. Anderson.
The married women in industry	J. Martin.
The periodic medical examination	G. Elliot.
Antityphoid inoculation in soldiers	G. B. Porter.
The construction of a sanitary dwelling	W. A. Thornley.

The Western Medical News, June, 1916:

Pituitrin in labour	J. A. Valens.
Report of a case of spina bifida, operated on the fourth day after birth	J. W. Turnbull.

L'Union Médicale du Canada, June, 1916:

Le foie, glande à sécretion interne	E. P. Benoit.
Conception moderne de l'enseignement théorique de la pathologie interne	A. Lesage.

Medical Societies

THE MEDICAL COUNCIL OF CANADA

The fourth annual meeting of the Medical Council of Canada took place at Ottawa on June 6th and 7th, the president, Dr. R. J. Gibson, in the chair and the registrar, Dr. R. W. Powell, acting as secretary. The following members were present: Sir Thomas Roddick, Hon. Dr. Thornton, Hon. Dr. Brett, Drs. Connell, Dagneau, Harris, Popham, Braithwaite, Lachapelle, MacCallum, McKechnie, McCallum, MacNeill, Morgan, Normand, Park, Shepherd, Simard, Spankie, Sugden, Thomson, Walker, White, and Young.

In presenting his report, the registrar expressed his satisfaction that throughout the past twelve months the administration of the affairs of the Council had gone steadily forward without friction of any kind, and reported that during that period twenty men had been enrolled under the ten year clause, and that a number of certificate forms were still outstanding. He was of opinion, however, that the absence of reciprocal arrangements between the Council and Great Britain had been one of the deterrant factors against the full success of the Council, both as to registration under the ten year clause and candidates for examination for the degree of L.M.C.C., and that the attitude adopted by the province of British Columbia in demanding examination in the final branches from those seeking their registration under the ten year clause had also operated to some extent against registration. During the year 1915, examinations were held at Winnipeg in June and at Montreal in October. Forty candidates presented themselves at the June examination and of these twenty-one passed successfully, twelve were rejected, and seven were referred. In October the candidates numbered forty-eight, of whom twenty-eight passed, eleven were rejected, and nine were referred in one or two subjects. It was the intention to hold the autumn examinations concurrently at Montreal and Halifax, but as the number of applicants for Halifax was small, it was decided to bring the Halifax candidates to Montreal and to pay their expenses rather than incur the expense of an examination at Halifax. This year the intention was to hold examinations at Winnipeg and Toronto, but less than ten candidates

registered for Winnipeg and it was decided to pay their expenses to and from Toronto and hold the examinations at Toronto only. The date of the spring examinations has been found to conflict with graduation in some of the universities and it is hoped that these examinations in future will be held at a date on which newly graduated men may be able to take them. Up to the present this has been impossible, or has been rendered possible only by the faculties of the universities holding examinations for graduation earlier than the scheduled dates.

The following is the list of candidates who were successful in passing the examinations of the Council held in Toronto last June: J. E. Affleck, of Glasgow Station, Ontario; C. M. Anderson, of Ottawa; S. G. Baldwin, of Vancouver; W. S. Downham, of London, Ontario; J. W. Fraser, of Whitby, Ontario; R. G. Ferguson, of Winnipeg; G. Hooper, of Ottawa; D. M. Livingstone, of Collingwood, Ontario; W. T. Kennedy, of Agincourt, Ontario; J. J. Knoll, of Daysland, Alberta; A. Y. McNair, of Vancouver; H. M. Macdonald, of Kingston; and W. Morris, of Winnipeg.

In the presidential address, Dr. Gibson said that three members of the Council were on active service, namely the vice-president Dr. Stewart, Dr. Kendall, and Dr. Bapty. He made fitting reference to the late Dr. Lindsay, of Halifax, and Dr. Jones, of Winnipeg, who have both died since the last session of the Council, and congratulated the Hon. Dr. Brett upon his appointment as Lieutenant-Governor of the province of Alberta. Reviewing the work of the Council he said that the number of men registering under the ten year clause had been less than had been expected but had improved during the last year and no doubt would continue to increase. The number of candidates coming up for examination had declined but this was probably due to the war. The province of Saskatchewan now accepted only the certificate of the Medical Board of Canada and he hoped other provincial boards would avail themselves of the examinations of the Dominion Medical Council.

The question of reciprocity between the Medical Council of Canada and the British Medical Council was brought up by Professor A. B. MacCallum, of the University of Toronto. Dr. Thornton referred to the communication upon this subject received from the Registrar of the British Medical Council which was submitted to the Council last year and which stated that such reciprocity was impossible unless reciprocal relations were first entered into by each of the provinces of the Dominion. Dr. Thornton

stated that with the exception of Alberta reciprocity was now in force between Great Britain and all the provinces of Canada.

A letter from the honourable Mr. Justice Hodgins was submitted to Council and the president and registrar were appointed to represent the Council before the Medical Commission.

A communication from Dr. McKechnie was read by the registrar, submitting an extract from a letter from one of the doctors with No. 5 Canadian Base Hospital, now at Salonica, referring to the importance of impressing upon the Canadian authorities the necessity of giving every man who enlists in the Canadian Army Medical Corps the privilege of terminating his engagement at the end of one year's service. The matter was brought to the attention of the Minister of Militia by the Executive Committee, who were referred to General Fiset and later to Colonel Potter, director general of medical services. The Committee were informed that if individual application were made members of the Canadian Army Medical Corps would be allowed to return to Canada after one year of active service.

A resolution was passed approving of the appointment of graduates of recognized American colleges of medicine to medical commissions in the American Legion or other units on the same footing as Canadian graduates. This matter was also brought to the attention of the Minister of Militia by the Executive Committee, who were informed that equal facilities would be granted by the Department of Militia to United States graduates for service with the American Legion or similar units, providing such graduates were fully qualified and of good standing.

An interim report of the Committee on Standards of Education and Examination was presented and the Committee was instructed to complete and print it as soon as possible. The report of the Executive Committee was read by the registrar and was adopted.

Dr. J. C. Connell, of Queen's University, Kingston, gave notice that he would introduce the following motion at the next meeting of Council, which will take place in Ottawa on June 12th, 1917:

> "Whereas it is desirable that this Council shall apply its resources towards the elevation of the standards of medical education in Canada.
>
> "Resolved that a scholarship be established to be awarded to the candidate making the highest total of marks in each of the examinations held by the Council the amount of the scholarship to be sufficient to permit the holder to spend at least a year in professional studies abroad, the direction of these studies to be under a committee of the Council."

Dr. R. E. Walker also gave notice that he would introduce the following resolution:

> "That the Medical Council of Canada appoint a Special Committee whose duty it shall be to inspect personally, and report upon the various medical schools and universities of Canada actively engaged in the teaching of medicine."

The Council will hold examinations at Montreal and Halifax coincidently on the second Tuesday in October, 1916, and at Toronto and Winnipeg on the third Tuesday in June, 1917. The officers for the year 1916-17 are: president, Dr. W. W. White, of St. John, New Brunswick; vice-president, Dr. E. P. Lachapelle, of Montreal; registrar, Dr. R. W. Powell, of Ottawa.

THE MEDICAL SOCIETY OF THE C.A.M.C., SHORNCLIFFE

The third meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held at Moore Barracks Officers' Mess, Memorial Hall, Sandgate, at 8 p.m., February 7th, 1916. Colonel G. S. Rennie, president, in the chair.

The minutes of the previous meeting were read and approved. Captain H. K. Bates, of the Military Hospital, Shorncliffe, was elected secretary to succeed Captain Mann.

Mr. Wilson gave a demonstration of the lungmotor said to be an improvement of the pulmotor and used for similar purposes.

Six clinical cases were shown:

1. A case of abdominal tumour, Major R. Bowie, Moore Barracks Hospital.

2. Two cases of paralysis of the hand; one caused by a cerebral lesion, and one by polio myelitis, Captain J. C. Wickham, Moore Barracks Hospital.

3. A case of foreign body in the brain, Captain R. W. Kennedy, Moore Barracks Hospital; *x*-ray photo shown by Captain W. H. Eagar, radiologist, Military Hospital, Shorncliffe.

4. Two cases of soldiers' irritable heart, Captain R. W. Kennedy, Moore Barracks Hospital.

A paper entitled "An analysis of one hundred and thirteen cases of trench nephritis" was read by Major A. Mackenzie, Moore Barracks Hospital.

The meeting was then adjourned.

The fourth meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held at West Cliff Eye and Ear Hospital, February 28th, 1916, at 8 p.m. Colonel G. S. Rennie, president, in the chair.

The minutes were read and approved.

Twenty-one clinical cases were exhibited. Left optic neuritis, luetic, following full course antisyphilitic treatment.

Two cases persistent sinus following mastoid operation, carious bone removed.

One case traumatic enucleation of eye caused by bomb explosion. Wound around mastoid caused facial paralysis.

One case habit spasm due to shell fire.

One case acute mastoiditis, radical operation.

Two cases of trachoma.

Two cases of iritis.

One case angular conjunctivitis, Morax bacillus shown.

One case gunshot wound (bullet) left eye.

One case concussion right eye-ball causing vitreous hæmorrhage from choroid. This is a common type of case in this war. The injury was a bullet wound of slight severity at external border of right eye. The injury caused immediate blindness.

One case choroiditis and retinitis, luetic, following full course of treatment.

One case injury to eye necessitating enucleation.

One case explosive injury to left eye. A motor mechanic in soldering a copper tube into a motor cycle unknowingly used a piece of a detonator which exploded.

A case of mucocele of eye. Drainage through antrum.

One case shell wound left antrum of Highmore. Persistent sinus. Drainage into nose and mouth.

One case infection of antrum caused by shell wound.

One case infection of antrum caused by bullet wound.

A case of nasal obstruction caused by adhesions between septum and turbinate, both sides, following submucous resection; inferior turbinate removed, adhesions separated, result good.

A case of fracture of mandible, special splint. Captain C. Waldron.

3. Address on "The purpose of the hospital," Lieutenant-Colonel Courtenay, O.C.

4. Notes on "Special work in Stationary Hospital at front," Lieutenant-Colonel S. H. McKee.

5. Paper on "Special work in the field ambulance at the front," Captain P. Bell.

The fifth meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held on Monday, March 13th, 1916, at Moore Barrack Officers' Mess, Chichester Memorial Hall, Sandgate, Lieutenant-Colonel Wallace A. Scott, vice-president, in the chair.

The minutes were read and approved. There being no further business the programme of the evening was proceeded with.

1. A case of paraplegia

A case of unilateral tremor, Captain R. W. Wilson, Moore Barracks Hospital.

2. A case of somatic tic, Captain R. W. Kenny, Moore Barracks Hospital.

3. Two cases of psoriasis;

Two cases of eczema, Captain H. R. Mustard, Moore Barracks Hospital.

4. A case of musculo spinal paralysis, Major E. Hogan, Shorncliffe Military Hospital.

5. Pathological specimens, Captain G. Wallace, Moore Barracks Hospital.

Horseshoe kidney;

Double hydronephrosis;

Acute endocarditis.

6. An interesting paper entitled "Fallacies in the localization of foreign bodies by the *x*-ray" was read by Captain W. H. Eagar, radiologist, Moore Barracks and Shorncliffe Military Hospitals.

The sixth meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held on Monday, March 27th, 1916, at Moore Barracks Officers' Mess, Sandage, Lieutenant-Colonel Scott, vice-president, in the chair.

The minutes of the previous meeting were read and approved. Captain R. W. Kenny, Moore Barracks Hospital, and Lieutenant-Colonel S. Hanford McKee, West Cliff Eye and Ear Hospital, were elected members of the programme committee.

The following clinical cases were shown:

1. A case of locomotor ataxia, Captain R. W. Wilson, Moore Barracks Hospital.

2. A case of cerebro-spinal syphilis, Major A. McKenzie, Moore Barracks Hospital.

3. A case for diagnosis, Captain G. L. Kennedy, Moore Barracks Hospital.

4. Four skin cases:
   (a) seborrhœic eczema.
   (b) squamous syphilide.
   (c) acute eczema.
   (d) Hanot's purpura, Captain H. B. Mustard, Moore Barracks Hospital.

5. A case of tumour of the neck, Captain H. C. Hall, Moore Barracks Hospital.

6. A case of extra genital chancre;

A case of ulcerative stomatitis, Captain A. W. Bagnall, Shorncliffe Military Hospital.

A specimen of lung tissue from a case of acute miliary tuberculosis was shown by Captain G. Wallace, Moore Barracks Hospital, the interest in the specimen being in the fact that though the lung tissue showed numerous advanced lesions, the sputum had been repeatedly negative.

A paper entitled "Notes from the board room" was read by Captain Charles Hunter, Standing Medical Board.

The meeting was then adjourned.

The seventh meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held on Monday, April 10th, 1916, at Moore Barracks Officers' Mess, Sandgate, Lieutenant-Colonel W. Scott, vice-president, in the chair.

The minutes were read and approved. There being no further business, the programme of the evening was proceeded with.

The following clinical cases were shown:

1. A case of ankylosis of the inferior maxilla, Captain G. L. Kennedy, Moore Barracks Hospital.

2. A case of traumatic facial paralysis, Captain H. C. Hall, Moore Barracks Hospital.

3. A case of submaxillary adenitis, Captain G. L. Kennedy, Moore Barracks Hospital.

4. Two cases of phthisis associated with trauma, Captains Kenny and Pratten.

5. A case of exophthalmic goitre.

A case of disordered action of the heart. Major A. MacKenzie, Moore Barracks Hospital.

6. A case of functional neurosis, Captain R. W. Wilson, Moore Barracks Hospital.

The programme being completed, the meeting was adjourned.

The eighth meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held on Monday, April 24th, 1916, at Granville Canadian Special Hospital, Ramsgate, on the invitation of Lieutenant-Colonel Watt, commanding officer. Ninety members and guests were present. Seventy members left Shorncliffe in ambulances, and arrived at Ramsgate at one p.m., where luncheon was provided by the medical staff at Chatham House, Ramsgate Hospital annexe.

After luncheon the members were shown round the hospital workshops and gymnasium. In these shops all splints and other appliances for treating orthopædic cases are made, also all motor repairs for hospital ambulances are done in a special department.

The medical meeting was called at 2.45 p.m., Lieutenant-Colonel Scott, vice-president, occupied the chair.

The following programme was presented by members of the Granville Hospital Staff.

1. Paper entitled "Psychogenetic condition," Major C. Russel.
2. Paper entitled "Posture as an aid to treatment," Major S. A. Smith, D.S.O.
3. Presentation of cases:
   (a) A case of "Pyloric ulcer," Captain A. S. McLeod.
   (b) A case of "Atrophy of the shoulder muscles," Captain Collins.
   (c) A case of "Sacrolization of the fifth lumbar vertebra," Captain D. A. Clark.
   (d) A case of "Bilharzia hæmatobia" with demonstration of the ova, Captain A. R. Robertson.
4. Exhibition of radiographs, Captain McMehan, radiographer.

The programme having been completed the members adjourned to the Officers' Mess where tea was served, after which an inspection of the main hospital took place. This hospital is very well equipped and the members of the staff were very obliging in showing all the apparatus in each department.

The inspection of the hospital concluded the meeting and the members returned to Shorncliffe, arriving about 6.30 p.m.

The ninth meeting of the Medical Society of the C.A.M.C., Shorncliffe, was held on Monday, May 8th, at Moore Barracks Officers' Mess, Memorial Hall, Sandgate, at 8 p.m., Colonel G. S. Rennie, president, in the chair.

The minutes were read and approved. There being no further business the programme was proceeded with.

1. Paper on Syphilis with demonstration of drawings and microscopical demonstration of "Leucocytozoon syphilidis," J. E. R. McDonach, F.R.C.S., surgeon to out-patients, London Lock Hospital.

2. A report of some cases of syphilis of the eye following treatment by salvarsan, Captain H. D. Courtenay, Westcliff Eye and Ear Hospital.

3. Exhibition of clinical cases:

(a) An exhibition of five cases of primary and five cases of secondary syphilis. Captain A. W. Bagnall, Shorncliffe Military Hospital.

(b) A case of general paresis, Captain Mustard, Moore Barracks Hospital.

(c) A case of general paresis, Captain A. W. Bagnall, Shorncliffe Military Hospital.

4. Demonstration of Spirochæta pallida from a primary sore, Captain H. K. Bates, Shorncliffe Military Hospital.

The programme having been completed the meeting was adjourned.

COLLEGE OF PHYSICIANS AND SURGEONS OF ONTARIO

The annual meeting of the Council of the College of Physicians and Surgeons of Ontario opened on Tuesday, June 27th. The new members taking their seats were Dr. F. R. Eccles, of London, and Dr. J. C. Connell, of Kingston.

The officers elected for the Council year 1916-1917 were:

President, Dr. Edmund E. King, Toronto; vice-president, Dr. W. E. Crain, Crysler, Ontario; registrar-treasurer, Dr. H. Wilberforce Aikins, Toronto; solicitor, H. S. Osler, K.C., Toronto; auditor, James F. Lawson, Toronto; stenographer, George Angus, Toronto; prosecutor, John Fyfe, Toronto.

The report of the Board of Examiners showed that, in the spring examinations of 1916, there were in all one hundred and twenty-nine candidates, of whom eighty-eight passed, and forty-one failed.

Dr. W. Spankie, of Wolfe Island, and Dr. H. S. Griffin, of Hamilton, were appointed, as representatives of the College, for the coming four years, on the Medical Council of Canada.

Appeals, emanating from twenty-four candidates, who had failed at the recent examinations, were considered. Of these two only were entertained.

The question of the proper handling of drug habitués was referred to the incoming Executive Co nmittee, with permission to bring it before the Royal Commission for consideration, if thought advisable.

The following motion, bearing upon the attitude which, in the judgement of the Council, should be assumed by the members of the college, in the matter of the carrying out of the provisions of the Ontario Temperance Act, was passed:

> "That, inasmuch as the government has imposed upon the medical profession the working out of the Ontario Temperance Act, according to Clause 51 of the Act, this Council desires to impress upon the profession at large the necessity of adhering to the Act with dignity and decorum, and that the registrar be instructed to provide the members of the college with a copy of the Clauses, and this resolution."

The Council adopted the report of the Special Committee appointed to consider the advisability of establishing a system of licensed midwives in Ontario. The report reads: "Conditions in the province at this time do not demand a system of licensed midwives."

The Council decided to request the Militia Council to provide that Canadian Army Medical Corps Officers should "have rank and compensation more in keeping with the services rendered."

The report of the Education Committee, as adopted by the Council, provides, *inter alia*,

1. That the question of unifor n matriculation standards be taken up, when the Canada Medical Council has issued its report on the same.

2. That the fifth year of the medical course shall be "wholly and exclusively academic."

3. That graduates in medicine of such foreign universities, as shall enjoy recognition under this College, will not be required hereafter to attend a full winter session of lectures and clinics in a Canadian medical College, before offering themselves for the college examinations.

4. The Council acceded to the request preferred by Queen's University and the University of Toronto, that the present summer session shall be regarded as a full, academic year, the College to hold its usual fall examination at the close of such session.

The same examiners, as had conducted the spring examinations, were reappointed.

A Special Committee was appointed, to act jointly with similar committees of the Ontario Medical Association and the Academy of Medicine, to approach the government, with a request for such amendments to the Workmen's Compensation Act, as would, in the operation of the same, provide for reasonable compensation for services rendered by members of the profession, in cases coming under the operation of the Act.

The Council adjourned on Friday, June 30th.

THE MEDICAL SOCIETY OF NOVA SCOTIA

The sixty-third annual meeting of the Medical Society of Nova Scotia took place on July 5th, 1916, at New Glasgow. Dr. Kennedy, of New Glasgow, was the president. It had been decided not to hold a meeting for the reading of papers on account of the disturbed conditions arising from the war; only a business meeting was held.

One paper, however, was read by Dr. A. P. Reid, now of Middleton; it dealt with his medical reminisences from the end of the fifties of last century down to the present time. These recollections were found to be most interesting.

The committee on the Copwell Library reported that the law-suit on the ownership of the library had been concluded. It had been decided that the library was the property of Dalhousie University which was to house it, but that the Society were trustees for the funds out of which the salary of a librarian and the purchase of books were to be met. The management of the library is to be the concern of a joint-committee on which the University and the Society are both represented.

The office bearers and various committees were appointed for the ensuing year. Professor Fraser Harris, of Dalhousie University, was elected president for 1916-17; and Dr. Sinclair Miller, of Stellarton, vice-president; Dr. J. R. Corston, of Halifax, secretary-treasurer. In the evening the members from a distance were entertained to dinner by the Pictou Medical Society. Dr. Kennedy was chairman; the Mayor of New Glasgow, Colonel Cantley, and representatives of the local press were also guests. Amongst other speakers at the dinner were: Captain (Dr.) W. H. Hattie, Department of Public Health, Halifax; Colonel Cantley of the Nova

Scotia Steel Works; Mayor Grant, of New Glasgow; Professor Fraser Harris; Dr. J. K. Macleod, of Sydney; and Dr. John Mackay, New Glasgow. A very pleasant evening was spent.

A telegram of greeting from his old friends in the Medical Society of Nova Scotia was despatched to Lieutenant-Colonel (Dr.) John Stewart, O.C. Dalhousie University (7th) Stationary Hospital now in France, a past-president of the Society.

SIMCOE COUNTY MEDICAL ASSOCIATION

The fourth annual meeting of the Simcoe County Medical Association took place at Barrie, Ontario, on June 21st, Dr. C. A. Harvey, of Orillia, presiding. Some thirty-five members were in attendance and several interesting papers were read. The officers elected for the year 1916-17 are: president, Dr. Spohn, of Penetanguishene; first vice-president, Dr. F. C. Stevenson, of Bradford; second vice-president, Dr. J. Mackay, of Collingwood; third vice-president, Dr. C. S. Wainwright, of Orillia; secretary-treasurer, Dr. H. T. Arnall, of Barrie.

ALBERTA MEDICAL ASSOCIATION

The annual meeting of the Alberta Medical Association will take place at the University of Alberta, Edmonton, on September 21st and 22nd, next, under the presidency of Dr. T. H. Whitelaw, of Edmonton.

PETERBOROUGH MEDICAL SOCIETY

At the annual meeting of the Peterborough Medical Society, held on May 18th, the following officers were elected for the coming year: president, Dr. F. C. Neal; 1st vice-president, Dr. J. B. Mann; 2nd vice-president, Dr. N. H. Sutton; treasurer, Dr. N. D. Buchanan; secretary, Dr. E. A. Hammond.

Medical Societies

CANADIAN MEDICAL ASSOCIATION:—President—Dr. Murray MacLaren, C.M.G., St. John, N.B. President-elect—Dr. R. E. McKechnie, Vancouver. Secretary-treasurer—Dr. W. W. Francis, 836 University Street, Montreal.

ACADEMY OF MEDICINE, TORONTO:—President—Dr. Herbert Bruce. Secretary—Dr. J. H. Elliot, 11 Spadina Road. Treasurer—Dr. W. A. Young.

ALBERTA MEDICAL ASSOCIATION:—President—Dr. T. H. Whitelaw, Edmonton. Secretary—Dr. H. H. Moshier, Edmonton.

Annual Meeting, Edmonton, September 21st and 22nd, 1916

ASSOCIATION OF MEDICAL OFFICERS OF THE MILITIA:—President—Lt.-Colonel A. T. Shillington, A.M.C., Ottawa. Secretary—Captain T. H. Leggett. A.M.C., Ottawa.

BRANT COUNTY MEDICAL SOCIETY:—President—Dr. E. R. Secord, Brantford. Secretary—Dr. M. N. Faris.

BRITISH COLUMBIA MEDICAL ASSOCIATION:—President—Dr. J. Glen Campbell, Vancouver. Secretary—Dr. H. W. Riggs, Vancouver.

CALGARY MEDICAL SOCIETY:—President—Dr. J. L. Allen. Secretary—Dr. J. E. Aikenhead. Treasurer—Dr. W. Shipley.

CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS:—President—Dr. J. G. Adami, Montreal. Secretary—Dr. George D. Porter, Ottawa.

CANADIAN HOSPITAL ASSOCIATION:—President—Dr. H. A. Boyce, Belleville. Secretary—Dr. J. N. E. Brown, Toronto.

CANADIAN PUBLIC HEALTH ASSOCIATION:—President—Dr. C. J. Hastings, Toronto. Secretary—Dr. O. Withrow, Lumsden Building, Toronto.

CENTRAL SOUTHERN ALBERTA MEDICAL SOCIETY:—President—Dr. J. S. Murray, Okotoks. Secretary-treasurer—Dr. G. E. Learmonth, High River.

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AN EPIDEMIC OF PNEUMOCOCCUS INFECTION

By Thomas McCrae, M.D.

Philadelphia

DURING the past winter many parts of the continent suffered from a prevalent epidemic with many of the clinical features of influenza. The predominant organism varied in different cities, but infection with the influenza bacillus was apparently not common. In all the cases which came under my observation in which the organism was determined, it proved to be the pneumococcus. There were a number of cases in the Jefferson Hospital and Medical School, so that there was an opportunity of studying the infection from the onset. The majority of the patients had symptoms common to acute infections, a sudden onset, fever, headache, and malaise, with very frequent involvement of the nose and throat.

The epidemic began among the medical students and a number were admitted to the hospital in whom the clinical features were much the same. The onset was sudden, usually with a chill or chilly sensations. The majority had high fever, headache, malaise and throat symptoms, with marked prostration. The pharynx was usually much injected and showed many fine prominent very red points. The fever was high, usually from 103° to 104°, showed very slight remission and terminated by crisis on the third or fourth day in the majority of the cases. The patients felt decidedly better in a few hours after the drop in temperature and if kept in bed for two or three days recovered completely. Of the others who were not in the hospital and who got up as soon as the temperature fell to normal, many had a relapse much more severe than the original attack. Throat cultures were made from a number of these cases and all showed pneumococci as the predominant organism.

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A few days later the infection attacked many of the patients who were in the hospital with other diseases. The epidemic went through the medical wards and attacked the majority of the patients. Some of them were acutely ill for some days, but all recovered and in no instance did the patient seem any the worse for the intercurrent disease. Patients with cardiac disease, renal disease, and arterio-sclerosis were among those attacked. They had the same general features, but in addition a most striking point in this group was the large proportion in whom *pleurisy* appeared. This had some unusual characteristics:

1. There was very slight complaint of pain and in several cases the pleurisy was found only on routine examination.

2. The extent of the pleura involved. The friction rub was usually present over a large area and in several patients was heard over the whole of one lung.

3. The persistence of the friction rub. In the majority it persisted for at least a week, in several for two weeks, and in one for three weeks. After the first few days there was rarely any pain even on deep breathing.

4. The persistence of the friction rub after the temperature had fallen to normal and the patients felt perfectly well of the acute intercurrent infection.

5. The occurrence of pleurisy on one side which cleared and was followed after a short interval by pleurisy on the other side.

The presumption is that the causal organism was the pneumococcus. We did not obtain any cultures from the pleura but with a pneumococcus infection of the throat the most probable view is that the pleurisy was secondary and caused by the same organism. There was no instance of serous or purulent effusion and in every case there was apparently complete recovery with good expansion, clear percussion note and normal breath sounds. There was no case of pericarditis. The absence of pneumonia was remarkable; in no instance of the infection in physicians, nurses, students, or patients did pneumonia result.

General Pneumococcus Infection. In no instance of the disease originating in the hospital did this follow, but several patients were brought to the hospital or seen in consultation. A very acute case was as follows:

The patient, a man, aged fifty-eight, seen in consultation with Dr. C. A. Walter, complained of chills and fever. The only point of importance in his past history was that he had suffered from gall stones, having had attacks at intervals for some years.

The present illness began about two weeks before. He felt badly and thought that he was suffering from the prevailing epidemic, popularly termed "grippe". For several days he felt badly but did not have any severe symptoms, and after a few days thought that he was practically well. He then had a severe chill followed by high fever and sweating. After the onset the chills recurred at irregular intervals, but he usually had two in the twenty-four hours. The temperature was high and somewhat irregular and occasionally rose to 105°. There had been profuse sweating and severe headache after the chills. He had no cough, digestive trouble or abdominal symptoms.

Examination. When I saw the patient he looked very badly. He had just had a profuse sweat and his temperature was 104°. He complained of severe pain about the angles of the jaw and in one shoulder, but nothing was found to explain this. The lungs were perfectly clear and the heart was not enlarged. The only finding was a soft murmur at the apex, which was not transmitted out. The pulse was 96. Examination of the abdomen was negative and there was no tenderness in the region of the gall bladder. The spleen was not palpable. The prostate was not enlarged, and there was no evidence of infection there. The urine was clear. The leucocytes were 41,000.

The problem of diagnosis was complicated by the possibility that he might have infection of the gall bladder, but in the absence of local signs this did not seem probable and the diagnosis of a general infection, possibly with an endocarditis, and probably due to the pneumococcus, was made. A blood culture was taken which yielded a pure culture of pneumococcus. The patient died two days later.

This was a very acute case with death within a week after the onset of general symptoms. The positive diagnosis could only be made by means of the blood culture, but the general symptoms coming on so soon after the attack of "grippe" suggested a general infection.

Another case of pneumococcus septicæmia showed a much longer duration and unusual features:

The patient was a man, aged forty-nine, who had a moderately severe attack of pneumonia with a slow termination by lysis. He had apparently recovered and the lung condition had cleared. At the time of the epidemic he suddenly became acutely ill, the temperature rose to over 103° and a friction rub was audible over practically the whole of the right side of the chest. From this time

to death, which occurred six weeks later, there was constant fever, usually very irregular, at times varying from 97° to 104° within twelve hours, with persistence of the friction rub. A blood culture taken on three occasions during this time gave a very profuse growth of pneumococci on each occasion. The leucocyte count was not particularly high, generally being between 10,000 and 14,000. There was no question about a pneumococcus septicæmia but we were particularly interested in the possibility of endocarditis of which, however, we were never sure as an autopsy was not obtained. The patient had a definite systolic murmur at the apex, but this was not transmitted to any great distance and it may have been due to cardiac dilatation.

This case is interesting in that the patient had apparently entirely recovered from an ordinary attack of lobar pneumonia and was convalescent when the symptoms due to the pneumococcus septicæmia began. It is interesting to speculate whether this came from the original pneumonic infection or represented an entirely fresh infection. One is rather inclined to suspect the latter. Had we known the strain of pneumococcus responsible for the attack of pneumonia and found the same strain in the latter infection it would have been suggestive. The organism obtained in the later course belonged to Type IV. There was nothing to suggest endocardial involvement during the attack of pneumonia and not until the septicæmia had been going on for some time. One interesting point in this patient was the long continued persistence of the widespread pleurisy.

Secondary Local Infections. These were not particularly frequent except in the form of pleurisy as noted previously. One unusual case of infection of an ovarian cyst with secondary peritonitis is as follows:

The patient, a woman, aged twenty-two years, was seen in consultation with Dr. T. F. Branson. Her present illness dated back six days. She had apparently contracted the prevalent epidemic, of which there were many cases in the College which she was attending. She had some fever and headache with general malaise, and following this quite marked diarrhœa. The stools were loose but not particularly offensive. With this she had a good deal of distension of the abdomen and complained of some abdominal pain. The temperature record was very irregular, but it did not go above 102°. There had been no symptoms suggestive of lung involvement.

Examination. The patient had a flushed face and looked ill.

There was a slight patch of consolidation at the left base with blowing breathing and a few sticky râles. The heart was clear. The abdomen was quite distended but there was no general tenderness or rigidity. She showed slight tenderness in the lower right quadrant. There was no tenderness on rectal examination and nothing abnormal was felt. The leucocytes were 20,000 per cmm.

In view of the evidence of a general infection and the patch at the base of the lung, the possibility of a local peritoneal infection was considered and also the possibility that some trouble with the appendix might be responsible for the abdominal symptoms. The signs were so indefinite that exploration did not seem to be indicated. In the next three or four days the patient was rather better and when I saw her four days later her general condition was decidedly improved. The patch at the base had cleared and she had less abdominal distension, but there was a suggestion of something more in the lower abdomen. There was some resistance, but no marked tenderness, rigidity or muscle spasm. The leucocytes had increased slightly and were now 29,000. The condition at this time suggested a local peritonitis and the question of operation was discussed, but she seemed to be improving and it was thought best to wait. As the condition did not change, operation was done a few days later and a local peritonitis found, which originated from an infected ovarian cyst. The cultures from the cyst and from the peritonitis gave the pneumococcus in pure culture. The patient did well and recovered completely.

In another patient acute cholecystitis and pleurisy occurred, the latter persisting for some time.

The patient was a healthy male, aged twenty-five years, who had the usual features of a general infection with moderate fever. After some days of fairly acute symptoms he felt better and got up, although he still had slight fever. This was followed by a sudden relapse, with slight repeated chills and higher fever. Very shortly there was severe pain in the region of the gall-bladder and rigidity and muscle spasm of the upper right rectus. Two days later the gall-bladder could be felt, there was slight jaundice and the leucocyte count rose to 20,000. Within a day the local symptoms began to subside, but with this there was complaint of pain over the right lower thorax. When I saw the patient there were definite signs of an acute pleurisy in the lower right side but no evidence of any consolidation. The signs of the acute cholecystitis were much less marked and they subsided rapidly. The pleurisy persisted for some days, but examination later showed no evidence of any permanent

change in the pleura. The most striking feature was the rapidity with which the acute process in the gall-bladder subsided.

Certain points are of interest:

1. The absence of pneumonia as a complication in the great majority of the cases.

2. The infrequency of suppuration when the number of cases of pleural infection is considered.

3. The absence of serious results in the patients in the hospital who were attacked. Many of them were seriously ill with the original disease and it seems remarkable that the acute intercurrent disease did not do them marked harm.

Between 35,000 and 40,000 dental operations a month are now performed by members of the Canadian Army Dental Corps, as compared with a monthly average of 17,000 during the first six months after its arrival in England in July, 1915. The number of dental officers is now about thirty-seven. The Corps is under the direction of Lieutenant-Colonel J. Alex Armstrong, with headquarters at Folkestone, England.

A BRIEF SURVEY OF SOME EXPERIENCES IN THE SURGERY OF THE PRESENT WAR

By Edward A. Archibald, Major, C.A.M.C.

WHEN one sits down to write, even in a very general way, an account of the surgical work of the present war, it becomes immediately obvious that one can only touch, as it were, the "high spots". At first sight one might think the scope of investigation, whether on the clinical or on the laboratory side, would be somewhat limited and soon worked out; but anybody who has ever tried to dig a little below the surface, knows the mistakenness of any such view, and, as a matter of fact, it has already become evident that the war will be at an end long before we shall have settled many of the problems with which we have been brought face to face by the injuries and illnesses of the war. For instance, what is "Trench fever"? What lies behind that diagnosis, so common on field medical cards, of D. A. H.? (disturbed action of the heart). How many strains are there of the Bac. perfringens? Are the new vaccines of Wright going to be effective? Can we do nothing to improve the traditional treatment of shock? What is the best line of treatment for abdominal injuries? Along all these lines, to mention only a few, we are still groping.

I do not pretend in the following pages to discuss any of these questions deeply; but it may be of some interest if I set down a somewhat brief summary of surgical experience along certain lines which have particularly interested me. It should be said that my service has been in a General Hospital at the base in France during the summer and fall of 1915, and in a Casualty Clearing Station near the front during the first four months of 1916.

Let us begin with certain observations on head injuries.

The type of head injury that reached us at the base from two to four, or more, days after receipt of injury was, in the great majority of instances, that of the tangential wound. A man suffering from a direct hit going through and through the head rarely lived to get to the base. There were in addition a certain number of shell wounds in which the fragment, generally of small size, had penetrated the bone, and was lodged at varying depths inside the

brain. These last remained without further development of serious symptoms with surprising frequency, and many were sent home to England.

With regard to the tangent wounds, particularly from high velocity bullets, the most striking fact, a fact which was particularly demonstrated to us at post mortems, was the extraordinary depth of destruction of the brain tissue caused by the lateral radiation of force given off as a result of the very velocity of the missile. The history of one case was as follows: A man came in with a tangential wound, whether from bullet or shell fragment could not be determined. The whole of the right forehead, and a small part of the left, had been carried clean away, leaving a broad, shallow gutter, filled with disorganized brain tissue. He recovered consciousness within two or three days, but never perfectly; his temperature shortly became normal; his wound, after being cleaned up, remained almost aseptic, and he went on for over two weeks in a fairly satisfactory condition. Then, suddenly, there occurred an escape of cerebro-spinal fluid which for the succeeding three days leaked away in considerable quantity. During those three days, his temperature, which had previously been constantly normal, maintained the level of 103° to 105°, and at the beginning of the fourth day, he died. There were no signs of meningitis. At post mortem we found that the necrosis of tissue had originally extended nearly two inches in depth, reaching the anterior horn of the ventricle, and this on both sides. The liquefaction necrosis occurring at the end of the three weeks had led to communication with the ventricle of the right side. There was no meningitis, except localized suppuration of brain surface in front which was well walled off. Several other cases have shown the same thing. In one parietal glancing injury, the necrosis had reached almost to the lateral ventricle. In another tangent wound of the vertex, the destruction extended actually down through the ventricle and into the optic thalamus.

Another observation which ran counter to my preconceived ideas was that death from speading cortical meningitis is comparatively rare. The pia-arachnoid seems to possess almost peritoneal properties in the way of forming adhesions; and the walling-off is certainly helped by the inevitable extrusion of small button hernias of brain through the holes of entry or of exit. which, paradoxical as it may sound, one is rather inclined to welcome on that account. In our series we had three deaths from meningitis, but none of these were spreading cortical infections from the surface wound. Two were metastatic by the blood from distant wounds; and one origin-

ated in the ventricle from the passing through it of a small fragment of a rifle grenade, while the cortical wound, though it suppurated, was well walled off. I may add that during the three months of my service at the front, I did not see a single case of meningitis.

In general, the cause of death in head injuries during the first few days, seems to be commotion from the radiation of lateral force, or, as one man lately in the *Lancet* explains it very plausibly, from the "splash effect" produced by the missile. When death occurs later, the cause is usually said to lie in a spreading encephalitis, though I have not myself seen that in our post mortems. But there is a large group of cases who die after the third or fourth day and even on in the second week, after promising well, and the post mortem fails to reveal any gross sufficient cause. There is, of course, present an injury of the brain, often extensive, but in some cases the injury may be of comparatively slight degree and situated in silent regions. I guess at the conception of the "last straw", of a sudden breaking down of the vital regulating mechanism in the medulla which is strained by the concussion of the missile, recovers partly with the absolute rest of unconsciousness and the early care, and then gives out with renewed, though mild, activity, as a sort of culmination of fatigue. I do not know of any microscopic investigation of these cases as yet.

Another interesting point about brain injuries is the general absence of serious compression signs. Only when the meningeals are torn, or the sinuses, and big hæmorrhages occur, are the typical compression signs found. In other words, the reaction of the brain tissue, œdema and ecchymosis, are rarely sufficient to slow the pulse, raise blood pressure over 150 m.m., or disturb the rhythm of respiration. It is possible that the coincident concussion effect on these centres may mask signs of compression; but in any case the patients do not usually die with these signs evident. Slight signs of compression, it is true, are not infrequent, but these are easily relieved by lumbar puncture.

On the basis of these two facts, the comparative rarity both of cortical meningitis, and of fatal compression (I had before coming out anticipated the latter but not the former) I laid down for myself a general plan of procedure, which consisted in operating only to clean up the wound in soft parts and bone, and to remove fragments of shell or of bone, only in so far as they were easily accessible; avoiding the disturbance of the edges of brain hernia for fear of breaking adhesions; eschewing as unnecessary the so-called "decompression" by removal of large areas of bone around the hole

of entry, and for the same reason the contralateral subtemporal decompression advised by some; and, by consequence, avoiding also the making of a very large curved flap of skin and pericranium. Up to recently the very general practice was to do what some called the "set operation,"—a big, indeed very big, flap, "decompression," (I do not think the removal of bone without opening the dura can give real decompression) and then the toilet of the wound itself, consisting in the removal of fragments and feeling for others with the finger or with some kind of probe to some depth in the brain. For myself, I cannot see the reasonableness of removing large amounts of bone from around the small hole made by the missile. The only possible reason, it seems to me, would be to remove from under the bone edge wedged-in pieces of bone or foreign body carrying hair, cloth, or soil. For that purpose, where it seems indicated, it is sufficient to remove a small ring of bone around the hole, so as to show a quarter or a half inch of intact dura. And this is done by many as a routine. But I have rarely found it to be necessary. In any case, small liberating incisions are all that is necessary; the big curved flap seems to me a waste both of the surgeon's time and of the patient's strength.

The suggestion has been made by Lt.-Colonel MacKenzie Forbes, that the big curved flap of the "set operation" should not be sutured into place, with drainage tubes at the two angles of the base, but should rather be folded back and held down by stitching it to the face or neck, with the object of securing a perfectly open wound in which it would be impossible for pus to collect and infect the brain wound. This suggestion has been carried out in quite a number of cases in the unit to which Lt.-Colonel Forbes was attached; and Captain Johnson read a paper on head injuries last fall at the Etaples Medical Society, in which he reported that the results had been much improved since adopting this plan. My own opinion is that this simple expedient for preventing the collection of pus under the large flap is rendered unnecessary by the still simpler expedient of not making a large flap. In nearly all cases a crucial incision after excision of the dirty wound edges is sufficient both for the necessary exposure of the wound in the bone and for drainage.

As to the question of putting drains in the brain itself, along the track of the missile, while some are against it, most are for it, and Colonel Sargent, who has had an enormous experience in the head injuries of this war, has devised a rather good form of tube for the purpose, made of aluminium with large meshes. It was de-

scribed in one of his articles in the January number of the *British Journal of Surgery*. I am strongly for the use of drains, and think it would be hard to improve on Sargent's drain. It is not that a true abscess develops often along the track or at the site of the missile; indeed this is rare, at least in the first three weeks following the injury. But there is frequently present a lot of destroyed mushy brain tissue which sometimes in the course of a few days becomes mixed with a small amount of pus, and which exudes easily into the lumen of the aluminium tube through its wide meshes, and can be removed very easily with a blunt curette, and a stream of saline. If this is not removed, the patient may die, presumably from infection, although at post mortem one finds very little pus, hardly sufficient, one would think, to have caused the death of itself. It is usual to find, too, a much larger sinus track that one would expect from the size of the missile, containing a quantity of brain mush which is clearly infected in spite of the absence of obvious pus; this I think also demands drainage.

My lumbar puncture observations are interesting. One usually finds within the first two to four days a marked rise in pressure, up to 500 mm. The arterial pressure is not correspondingly raised, being ordinarily not over 140 and often below 130. These facts are true both of the cases seen at the front and in those of the base. It is generally acknowledged now that a formal decompression, subtemporal or *in loco*, is unnecessary save in the rarest instances. I have only seen one case in which I thought it in place to consider the question of such an operation, that was a perforating bullet wound about the middle of the head, where blood pressure was 150 mm., pulse between 54 and 60, and respiration stertorous though not grouped. He lived only two or three hours after admission and some seven or eight hours after being hit. I did nothing. Post mortem showed a largish collection of blood in the left posterior fossa, with also a small quantity in the left middle fossa, and thin plaque hæmorrhage all over the cortex of both hemispheres. But it was obvious that he died of *commotio*, that most infernal jostle which the lateral force given off in the passage of a high-velocity bullet imparts to the brain, rather than of compression, though this was of sufficient degree to give signs. Compression then in nearly all instances is insufficient to demand a decompression operation; yet frequently it is sufficient, as one sees in the almost regular development of small brain herniæ, to suggest the advisability of some measure of relief. We are now pretty well agreed that a lumbar puncture, repeated if necessary, is sufficient to afford that relief;

and our lumbar puncture measurements indicate this. I have made it a rule from the beginning to lower the spinal fluid pressure very gradually and to stop the withdrawal of fluid when pressure falls to 170 or 180. If the pressure is over 400 I do not let it get below 200; and if, as has happened in rare instances, it is very high, I do not reduce below 300. The danger of taking away more lies not alone in the possible forcing down of the brain stem into the foramen magnum, with rapid medullary death,* but also in the excessive reduction of a small hernia, and consequent tear of the protecting adhesions of pia-arachnoid round the bone opening.

From a number of simultaneous observations of the arterial blood pressure and the spinal fluid pressure it seems clear that one may have a greatly heightened pressure in the spinal canal with little if any rise in pressure in the arteries.

Abdominal Wounds

Now as to the abdominal wounds we saw very few indeed of them at the base; and they were cases of secondary abscesses from wounds which had not been operated on. The real abdominal surgery belongs entirely to the Casualty Clearing Stations. You will probably have read the articles of Meier and Taylor in a December number of the *Lancet*, and those of Cuthbert Wallace, also in the *Lancet* (I believe his second article has just come out; I have not yet seen it); as well as the remarks of Sir Anthony Bowlby in his Bradshaw lecture on "Wounds in War". The subject is of the greatest importance and, to me, by all odds the most interesting. In the British Expeditionary Force there must be by now over a thousand cases operated on. And, although the reports from many of the Casualty Clearing Stations are yet to be published, we are beginning to get our ideas a bit crystallized as to the results that may be expected. I was very kindly allowed to spend five days with Meier and Taylor (attached for instructional purposes) and saw some of their work. They had in their first series of fifty cases remarkably good results, a mortality of only about 41 per cent. Although a well-known English surgeon, who has not been to the

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* Since writing the above I have had a striking illustration of this danger. In a man with penetrating shell wound of the occipital, unconscious, I found a cerebro-spinal fluid pressure of 1300 mm., a most extraordinary rise; the blood pressure just before was 135 and pulse about 55, respirations regular. I drew off gradually about 35 cc. of blood stained fluid, reducing the pressure to 500 mm., which is still from three to four times the normal. The blood pressure taken very soon afterwards was 165; his pulse went into vagus paralysis, and he died in half an hour.

front, cheerfully asserts in a recent small text-book upon abdominal injuries that 60 per cent. of the abdominal wounds ought to recover with operation, those who are doing the operations out here hold a very different opinion. Meier and Taylor volunteered to me the statement that their second series of fifty were going to be decidedly more unfavourable than the first. The men at the other Clearing Stations in this, and the neighbouring army, are also much less optimistic than the outsider (like myself when I arrived here) who may have read Meier and Taylor's article and is judging the question on the basis of civilian experience. Instead of 60 per cent. recoveries, they expect something between 30 and 40, according to the run of the cases. In this, as in other statistics, a great deal depends on selection of cases. One of the first that I operated on, a man with a transverse bullet wound in the upper half of the abdomen wounding colon, duodenum, and right kidney, with a very poor pulse, with a large amount of free blood in the cavity, and in moderate shock—altogether, as to operation, a borderland case—this one died apparently of shock some hours after the operation. When results are ultimately published, I hope there will be included a consideration of the cases in which operation was refused. If the patient is to be accorded that one chance in a hundred to which he is surely entitled, statistics are bound to suffer.

The subject is so big a one that I can touch only upon those outstanding questions which loom so large in all our minds, chiefly, the causes of death and the means of saving life. The damage done, first of all, varies enormously from patient to patient according to the size of the shell fragment or the velocity of the bullet, and of course also according to the location and direction of the missile, and finally according to the presence or absence of other severe lesions of the body. There are good cases and bad cases. For example, one man in the last convoy had a wound of entry in the left iliac fossa, and no wound of exit; the missile had made two small holes in the sigmoid, passed through the ilium and was presumably buried in the deep muscles of the buttock. He did well. Another man in the same convoy came in pulseless; the wound of entry was in the left hypochondrium in the axillary line, and that of exit in the right buttock; the bullet had torn the small bowel across completely (a bursting effect, I think) in five different places, and ruptured the mesentery which supplied about two feet of bowel (already turning dark), and had finished by disorganizing the cæcum and its junction with the ilium; the abdomen, dull to percussion throughout, was full of blood which was coming from

the torn mesentery and from the cæcal regions. He died inside of four hours, obviously of shock and hæmorrhage combined. The one could hardly be lost; the other could never be saved. Between these two extremes, however, there is a fairly large class of reasonably good cases, in which one finds more or less extensive injuries to the gut, requiring suture and inturning of several holes, or a resection, but, to the patient's advantage, on the other hand, an absence of fæcal contamination and of peritonitis, and not a bad general condition. These, if left untouched, would surely die; whereas operation saves a respectable proportion. Practically all these patients come in from the Field Ambulances inside of seven or eight hours from the time of being hit, at least in this district, and often in much less time. Our earliest has been two hours. They have all had a hypo of a half grain of morphia at the Field Ambulance. Whether on this account, or more likely from the mesenteric paralysis caused by the injury, there is rarely any appreciable exit of bowel contents, even after eight hours, or indeed, in one patient on whom I operated lately, even after nearly twenty-four hours.

As to the incision, its location varies with the site of injury, but it is apt to be near the middle line. Meier and Taylor prefer where possible an incision not over four inches long, and they peel the gut out and in again. I adopted this plan at first, but have gone over to a long incision and immediate evisceration without tension on the mesentery, and particularly so if the abdomen contains any material amount of blood. The question is still, however, very much of an open one. It is probable that the smaller incision and the avoidance of pull upon the mesentery involve less shock. The necessity of rapid operating, as well as the liability to infection, precludes the layer suturing for closing the abdomen, and forces us to through and through silk worm gut stitches.

The causes of death are shock, hæmorrhage, peritonitis, intestinal obstruction of the paralytic type, gas gangrene of the wound, and pneumonia. It is a fearful gauntlet to run.

With regard to the first two, shock and hæmorrhage, what soon became obvious was that they are so often coincidently present that it is difficult to decide which is the more important factor in bringing about the fatal issue. The question has a very practical bearing upon treatment. I have talked the matter over with some half-dozen surgeons of different Clearing Hospitals. Some assert that hæmorrhage, in and by itself, very rarely causes death, and Captain Stokes, the pathologist to this army, who has had a very

large experience, is decidedly of this opinion. For myself, I am strongly inclined to this view. Others, however, emphasize the fact that at operation an actively bleeding vessel is often found, still adding to an already tremendous effusion which seems to fill the cavity; and they conclude that hæmorrhage is the more frequent cause of death.

If we only knew what shock was, essentially, we might decide the question. But in all probability the truth is on both sides and on neither. I imagine that, even where bleeding is excessive, shock enters in; and that one completes what the other begins. If shock consists in a disturbance of the rhythm of the circulation, characterized by the displacement of a critical quantity of blood from the arterial to the venous side, then hæmorrhage from the arterial side would be apt to aggravate the condition. On the other hand, to transfuse blood, introducing it on the venous side, does not get at the root of the trouble, which I conceive to be a serious upset of the rhythm of the circulation, due to interference with the physiological, nervous equilibrium of the vaso-motor system, probably affecting the veno-pressor factor more than that of arterial tone. I have given blood (17 ounces) to one abdominal case with serious lesions of the gut, and severe internal hæmorrhage, and it did no good, either immediate or remote. The man died in a few hours from shock. I have given salt solution to others, and while it brought back the pulse at the wrist (they were all pulseless or nearly so), this effect was very transitory, and they have died within a short time. In fact, in two cases, I got the impression that the intravenous saline had actually hastened death. Its effect is purely one of volume; the fluid soon escapes into the urine or the tissues; and the fundamental disorder is not remedied. While this has been the case with the wounds of the abdomen, I must say that several patients suffering from severe wounds of the extremities, in shock, pulseless, or nearly so, have been apparently saved by a timely infusion of saline. The nature, or the degree of the shock, in one and the other instance, is probably different. I might add that latterly I have employed instead of normal saline a gelatine solution (25 grammes to the litre) as recommended by Hogan of San Francisco (*Jour. Amer. Med. Assoc.*, July, 1915), the idea being that such a solution, colloidal in nature as it is, will stay in the vessels much longer than saline. This I have found to be true enough; the pulse and blood pressure are restored, though remaining low, for from five to eight hours instead of one or two. While this has apparently saved life in one or two cases of injury to the extremities with

hæmorrhage, the ultimate result in the abdominal cases has not been avoided. I tried amyl nitrate in one case, on the theory that the upset of the circulation was to be found in a spastic contraction of the peripheral arterioles, from the radial or even the brachial downwards, and so throughout the body. Possibly I used it too late; at any rate it accomplished nothing. By the way, there is perhaps some support for this view of the cause of shock in the fact that such patients are always conscious till immediately before death. We are fairly certain that the cerebral vessels are not supplied with vaso-motor nerves. Consequently, while the pulse at the wrist is quite gone (let us say from a tonic spasm of the radial arteries) the vessels of the brain are opened and the unconsciousness of cerebral anæmia is conspicuous by its absence.

Finally, I tried in one case, deep pressure on the abdomen with the flat of the hands every five to ten seconds for over an hour. The injuries concerned the extremities only. I hoped to get a sort of artificial circulation by emptying the abdominal veins regularly. I could see no improvement, and the man died in another hour or less.

There are known up here instances of death from shock as the result of quite trifling injuries. One reported to me concerned a man who had been hit on the tibia by a very small fragment of shell.

I feel rather hopeless over the treatment of these shock cases, that is, the really serious ones. We know so little of shock beyond a certain point. If we only had out here at the front a commission to study it, consisting, let us say, of a physiologist, a pathologist, and a couple of clinical men, all of them experts, we might be able to dig deep into the problem.

As to symptoms, one finds the picture about the same as that familiar to us in the bad industrial accidents of civil practice. I take blood pressure records when the patients enter, and frequently find it as low as 60 mm., with a diastolic of 40, and have even got one to register at 30 mm. with diastolic of between 15 and 20. But when the patient is pulseless at the radial, even though the brachial can be felt, it may be impossible to get the Tycos to register at all. Under such circumstances it becomes a serious question whether one should operate at all on the abdomen. I find that the surgeons here as a rule advise operation, in order not to miss a hæmorrhage which may be going on. As the patient, however, is also very cold (the thermometer will frequently fail to rise above its low mark of 92° even in the rectum) they usually wait

an hour or so, and crowd him with hot water bottles, and give a hot rectal saline. Then, if there is any pulse at all, and the patient is not obviously moribund, they proceed to operation. The number of patients saved in such circumstances is exceedingly small; yet Meier and Taylor record one at least.

While still rather ignorant in this matter, I cannot help feeling that the patient very rarely dies from hæmorrhage alone, unless a large vessel is wounded such as the inferior cava, or the aorta, or one of the larger abdominal arteries. In a patient operated on recently, twelve hours after being hit, his general condition being quite tolerable, with in particular a blood pressure of 128, I found the abdomen "full of blood"; (well on to two pints I should say) and when I pulled out a group of coils of jejunum there appeared a large rent in the mesentery from which blood was both welling up and spurting, both vein and artery being wounded. Obviously, these vessels had not been bleeding continuously for the twelve hours since the infliction of his injury; the occluding clot must have been disturbed by the manipulation of operation. Now the amount of blood effused into the cavity in this instance was quite as large as that which is ordinarily found at post mortem in other cases dying without operation under a diagnosis of shock, and in which the spectator of the post mortem, or the surgeon whose conviction happens to be that most of these patients do die of hæmorrhage, would in fact say that hæmorrhage had clearly been the cause of death. And I may add that the actual amount of blood which, by spurting out upon the incision of the peritoneum and by its continual welling up during mopping, gives rise to the impression that the abdomen is "full of blood" (the common phrase) amounts as measured at autopsy in two such cases to 35 ounces in the one and 46 ounces in the other. Consequently it would seem reasonable to conclude that shock plays at least a much more important rôle in the causation of death than does hæmorrhage. And if this is the case in the patients who die without operation, how much more must it be the case in those in whom the shock of operation is added to that of the injury.

Ought one therefore to delay operation in these very bad abdominal injuries that come in with low blood pressure, low subnormal temperature, pale or cyanotic, and almost pulseless? One is on the horns of a dilemma. For myself, I feel that my experience is still far from sufficient to justify any solid expression of opinion. And, doubtless, the careful observer with large experience will often be able from case to case to cast a correct judgment, whether

to wait for a rally from shock or to go on to immediate operation. But for the present, I feel inclined towards the policy of waiting till some improvement in the vital functions becomes apparent. At any rate, in the few instances in which I have delayed and death has supervened within a few hours without signs of a rally, I have not had to regret the decision; the autopsies showed that death was not due to hæmorrhage alone, nor to bowel lesions which might have been repaired. I think that the risk of progressing hæmorrhage is a small one. It should be said, however, that the teaching at the front is to the effect that to wait longer than one or two hours does no good, because, if there are no signs of improvement within that delay, shock does not pass, and one is ultimately in the position of operating under still worse conditions, or of not operating at all. As to the effect of the anæsthetic, it has been observed that ether seems to improve the pulse markedly in shock (is this by dilating the peripheral vessels?). In any case, it is obvious that if one were to feel justified in waiting, one ought to attempt an accurate diagnosis between shock and hæmorrhage, and try to gauge particularly the amount of the latter if both seem to be present. I have taken blood pressure records in all the cases so far (nearly forty) and I think they are likely to prove useful in respect of such diagnoses. Thus to-day (April 5th) there came in a man, almost exsanguinated, bleached out, with a large shell wound of the right thorax, from which, on changing the dressing, a large quantity of blood poured out. It had clearly been collecting in his chest—a case of pure hæmorrhage without shock. Yet his blood pressure was 100 and his pulse not bad. Abdominal cases with the belly full of blood have given pressures of 120 to 128 mm. when the symptoms of shock were absent. On the other hand, we have had cases of shock from injury to the extremities or body, without gross hæmorrhage in which the blood pressure has been 60, or 40 mm., or nothing at all. It has to be, in other words, a very large hæmorrhage that reduces blood pressure seriously; and in abdominal injuries in particular I think I can say this much, that in the presence of a blood pressure of 90 or over, shock is not to be feared, though hæmorrhage may be considerable; while if the blood pressure is 70 mm. or lower, shock is very much to be feared, and hæmorrhage has not very much to do with it, except as aggravating probably, to a moderate extent, the condition of shock.

In my experience, the most frequent cause of death, after shock, is paralytic obstruction of the bowel. The patient gets nicely over the operation, and may appear to be doing well for 36

to 48 hours. Then he begins to vomit, and, if unrelieved, dies in a short delay with considerable distension, chiefly of the stomach, duodenum, and upper jejunum, but sometimes of the whole small bowel and the transverse colon. The vomitus is often, though not always, of the coffee-ground type; the temperature is apt to be subnormal, the pulse increasingly rapid; the respiration quick and shallow, and the blood pressure low. The patient is disturbed by eructations of gas and by hiccoughs; but his mind is clear to the last, and he suffers very little except from the pain of vomiting. Occasionally he vomits only once, very soon before death. It is a picture of toxæmia. The post mortem frequently confirms the clinical diagnosis, both that peritonitis is absent and a dynamic obstruction present. Frequently, there are found submucous petechial ecchymoses in the stomach and duodenum. This is the classical picture of the acute toxæmia from high obstruction which the American School, particularly Whippel, Stone and Bernhein, Hartwell, McKenna and others, have done so much to elucidate.

What can be done for such cases? Most of the men up here admit that they are not infrequent and are very fatal. One says he gives up the case as hopeless when vomiting of this sort appears. Another says that washing out the stomach is of value; another that pituitrin is a regular sheet anchor; another that pituitrin is very unreliable, but that if one does a side-to-side anastomosis after resection instead of the usual end-to-end, the paralysis of the gut is much more frequently avoided. Parenthetically, I might observe with regard to pituitrin that as long as it was given subcutaneously it was very frequently void of effect; but since giving it intramuscularly, it has rarely failed to move the bowels.

Handley has recently proposed the operation of short-circuiting the jejunum above the site of lesion to the transverse colon, plus a cæcostomy, just as for his "ileus duplex".

My own experience leads me to conclude that the bowel paralysis is often most obstinate; that enemas do very little good; that when pituitrin fails, eserin may succeed; and that Handley's operation may fail entirely because of continued paralysis of the jejunum as a whole. I think that a temporary jejunostomy with a catheter, such as Chipman and myself were using before the war in similar cases due to general peritonitis, will prove to be the best means of saving these patients. I have done this in three cases. In all, it worked immediate cessation of the vomiting; but all three died, two from septic broncho-pneumonia, the other from stagnation in the eight or nine feet between the site of jejunostomy and that of re-

section. Is one to be heroic enough to put in two or three holes and wash the whole bowel out from top to bottom with a sort of hose attachment? I rather think it would do them good; at any rate, I see no objection to doing it for the upper seven or eight feet of bowel.

Death from peritonitis is not nearly so frequent as one would expect. Of course, half of the patients who do die, die before general peritonitis has time to declare itself. But the lack of exit of fæcal contents (I have only seen two cases of gross soiling in a series of close on thirty) accounts largely for this infrequency. I think we have found an agent of some value in eusol. I have been quite surprised, since using it to sponge off the areas of bowel suture, and to irrigate the cavity, to see how little evidence of peritonitis can be found at post mortem. But where there is serious gross soiling, eusol is still insufficient to prevent peritonitis. Ether has been tried up here, but Sir Anthony Bowlby informs me that it is apt to cause marked collapse if put into the abdomen in any quantity. I found that to be true in one case of tuberculous peritonitis in which I used it at home. Some of the French, and one or two of the men on our front, have, however, used ether in this way and speak moderately well of it. Only two cases of my series have died from peritonitis.

Pneumonia, or septic bronchitis, are complications which we dread very much. A great many of the men have chronic bronchitis from the trench life to start with, and they seem to get "chesty" very easily after ether and an extensive abdominal operation. The frequent distension of stomach and bowel helps this on by interference with the diaphragm. Lately, we have been using the Shipway apparatus which delivers warm ether vapour into the mask, and in bad cases have combined it with oxygen, and our impression is that chest complications are decidedly less frequent.

Gas gangrene of the abdominal wounds has not yet occurred in my list; but I am told that Captain Taylor lost five cases in a series of eighty from this cause, the bowel and peritoneum doing well.

Altogether, the abdominal cases are easily the most difficult we have to deal with. Meier and Taylor have published quite a remarkable series with 59 per cent. recoveries in their first fifty cases. Colonel Wallace reports a large series with something under 40 per cent., and other surgeons in Clearing Stations in the neighbourhood are showing 35 per cent. and around that. I have not made out my own figures yet accurately, but I know they run about 35 per cent. recoveries. Statistics are of little value, as so much depends

on the run of cases, on the difficulties of different districts in getting the wounded evacuated from the firing line, and on the selection of cases for operation. But one thing I know, and that is sufficient: many men are being saved by operation who were otherwise doomed; and very few, if any, are lost by operation who would otherwise be saved. Operation is not killing the ones who would get better by abstention. Abstention is killing many who would get better by operation.

Thoracic Injuries

The injuries of the pleura and lung are being taken over very largely by the medical men. Operation is rarely indicated, and is formally discouraged by the authorities except in rare instances. My experience at the base left me unprepared for what I was to see at the front. In the one place they are nearly all in fairly good condition; in the other, they are frequently, upon entrance, in a most alarming state. They come in from the field ambulances dyspnœic (I speak of the bad cases, which are numerous), orthopnœic, with rapid and poor pulse, deeply cyanotic, spitting blood, sometimes profusely, with anxiety in their look, blood welling out from the wound, and air whistling in and out of it. Pack the wound very tightly, and they improve remarkably. They are given morphia freely and let alone. The great majority after twelve to twenty-four or forty-eight hours of severe dyspnœa with cyanosis, get much easier, and after five to seven days are able to make the journey to the base. Orders are to keep all chest cases at least five days in the Clearing Hospital. There are occasionally very bad cases which die in the first twenty-four hours, with progressive dyspnœa and cyanosis. While interference is on the whole deprecated by the authorities, an aspiration is tried by some with good effect at times. Undoubtedly an acute pneumothorax and extensive hæmorrhage in one pleura can kill, apparently by pure mechanical interference with the heart and lung. I suspect that in some of these at least the pneumothorax is a valvular one; but as yet I have observed no case of mediastinal emphysema. Like all other base hospitals, we had a large experience in lung injuries last summer and autumn, and Major Campbell Howard has analysed them very carefully. In a large number, following the advice of Sir John Rose Bradford, we aspirated the blood about the tenth day and replaced immediately with oxygen. This procedure seemed to hasten the recovery of approximately normal conditions inside the pleura to a large degree; and I understand that the late results as observed in

the hospitals in England have been most satisfactory, even in cases in which shell fragments remain embedded in the lung.

Injuries to the Extremities

As to injuries to the extremities, we are obliged to be decidedly more radical here than in civilian practice. The remarkably destructive effect of high velocity bullets or of the fragments from high explosive shells, by which the muscles, or any other tissue, are pulped for a considerable distance (one to three inches) outside of the actual track of the missile; the extraordinary comminution of the bone; the inevitable soiling; the almost constant presence of the Bac. perfringens; all these considerations lead us to amputate here when we would try to save at home. A shattered knee joint, for instance, with a large ragged wound means amputation. The flush amputation, often called "flapless", in infections is almost *de rigeur*, and wisely so. With bullet wounds, however, one can be very much more conservative than with shell wounds. I have had to regret trying to save one or two legs, and I have had to regret trying to make flaps. Gas gangrene is very common. When it is confined to the subcutaneous tissue, we do not fear it much, but if it gets much of a start up the thigh, especially if it invades the muscles, it becomes dangerous. And the danger seems to lie rather in its getting a start. If recognized early, and laid open ruthlessly, it is astonishing what desperate-looking cases will recover. But those infections that run up the deep muscles from a punctured wound, or which develop under the gluteals from a wound of the pelvis, are very apt to kill in spite of amputation or laying open. One sees gas gangrene on the whole more frequently at the front than at the base. The new anti-gangrene vaccine of Wright is just now being distributed, but we have as yet no experience of it.

General Treatment of Wounds

The general treatment of wounds has brought forth a great mass of literature, concerning itself chiefly with infections and fractures. The hypertonic salt solution of Wright and the eusol of Lorraine Smith (which corresponds closely with Dakin's hypochlorite solution) are the two great additions to our stock of antiseptic agents. I need not describe them in detail, as doubtless everybody is familiar with them from reading. For myself, if I had to choose between them, I would take eusol. But in the treatment of these ragged and fractuous wounds from shell fragments, neither

the one nor the other can do more than a very partial work. The true antiseptic is radical excision of the track—a self-evident proposition, of course. The method is feasible more often than one would think. With time and careful work, one can excise a through-and-through track, even in the thigh, and easily enough in the arm. I did this a good deal at base when the infection did not extend deep below the surface, as in most of them is the case. I refer to the surface of the septic track through the muscles, not to the surface of the skin. To my surprise I found that the results were very good. Quite often there was no reinfection of the wound track. But operation of this sort made obvious the futility of trusting to eusol or any other germicide without at least a thorough preliminary opening up of the wound; for it was the rule to find in the muscle tissue not only necrosis, but infection in pockets, far beneath the surface infection. The explosive force of the missile or the force radiated laterally by the passage of a high velocity bullet not only devitalizes the tissues (so that often one can wipe off muscle tissue with a swab) but also separates them, as one might fluff out a feather duster by blowing into it. The same force drives into the recesses thus momentarily formed infection and foreign bodies of all sorts. Whereupon the muscle falls in on itself again, and then what chance has eusol or five per cent. salt to get to the spot? As to the real value of these new antiseptic agents, I am inclined to think that they may be considered as complements of each other rather than as rivals; that they fulfil different indications—salt to stimulate resistance of the surface early, eusol to render that surface aseptic; the one to be used early, the other after two or three days. Carrel urges that the ideal treatment consists in very early incision of all wounds before bacteria have had time to get a proper hold, with frequent installation of hypochlorite solution into the furthest recesses of the wound. But it is obvious that complete excision, which alone removes the pockets of infection, followed by the hypochlorite lotion, is still better.

I see I have wandered a bit from the question of the relative value of eusol and hypertonic salt. But after all, as Dooley, the philosopher, once remarked, "It doesn't matter much which you have, provided you have a good nurse." And "nurse" here means very free drainage and everything laid wide open. We have made some horrible-looking incisions and there have been some protests, I believe, from men in base hospitals in England; but I think that the practice has saved many more lives than has that of the picayune skin-opening and the big tube shoved into a narrow track.

The nature of the infections has been most interesting. At the base, by all odds, the most frequent is what we call the "mixed" infection. A culture from such a wound, which is usually very foul smelling, shows a large number of organisms, most of which are demonstrably original in the intestinal tract. Clinically, the nature of the infection is comparatively benign, except in the rather rare instances of the spreading streptococcus cellulitis with which we are familiar in civil surgery, and the somewhat less rare ones of gas gangrene. So benign is this mixed infection when uncomplicated that it can be cut out freely without fear of opening blood vessels to an acute septicæmia. The inflamed tissue with its sloughy suppurating surface does not usually extend more than one-eighth to one-quarter inch in depth, and, as one sees it at base, two to four days after the injury, it is more or less demarcated off from the subjacent tissue. The latter may be healthy or may be in a state of aseptic necrosis, whether from the lateral force of the missile, or from its heat, I cannot say.

In Casualty Clearing Stations, the bulk of the wounded pass on to base so quickly that we see chiefly the more severe infections, above all gas gangrene, because such are held over as being unfit to travel. "G. G.," as the M. O.'s often call it, is the most terrible thing at times, while at other times it is curiously benign. Captain Rhea assured us early in the game that we had to expect to find gas in the tissues produced by other organisms than that of true gas gangrene, or by milder strains possibly of that organism. And that has proved to be the case. Major Hill had one man with a wound of the rectum, which he had to open very high up alongside the gut, and also had to incise the buttocks, perineum, and groin; this man got well. Captain Stokes tells me of one patient from whose cerebro-spinal fluid he cultivated the gas bacillus, who had symptoms of meningitis secondary to a gas wound, and who got rapidly well after incision and lumbar puncture. On the other hand, a flush amputation above a dirty wound of the knee, apparently through healthy tissue, may fail to save life. I have seen such a case die in twenty-four hours after the amputation.

Turning to another subject, namely, fractures, it should be observed before everything else that the Army Medical Service has accomplished great things in the extraordinary variety and excellence of the splints which its members have devised during this war. I cannot begin in the space at my disposal to describe them. Major Sinclair at Boulogne has been especially ingenious and at the same time practical, particularly in combining successfully immobiliza-

tion of fractured ends, opportunity for continual irrigation, and freedom of movement for the body. Many of these splints are described in a small book drawn up by the Consulting Surgeons and Physicians of the Expeditionary Force in France and issued by the War Office for the guidance of medical officers, a manual, by the way, which is a model in every respect.

Secondary Hæmorrhages

One of the things which perhaps more than any other in the surgery of Base Hospitals impresses the surgeon of civilian training is the frequency of secondary hæmorrhages. They are seen only at Base Hospitals, not at the Casualty Clearing Stations. The subject has been discussed at a number of meetings of Base Medical Societies. Infection, of course, is the one cause; but infection, assisted often by mass necrosis of tissue. As to operation, it is generally agreed that ligation at the point of bleeding is the best procedure. Ligation in continuity is followed too often by recurrences. It should be said, however, that frequently ligation at the bleeding point is impossible because one cannot find the bleeding point. The bleeding has ceased, as the result of clotting or of exsanguination, and the vessel, lodged as it usually is in a mass of infected granulation tissue, may be very difficult to find. The mortality in a large series of cases has been shown to be quite high, partly from pure loss of blood, partly from the aggravation of sepsis already present as the result of the additional loss of resistance through loss of blood.

I have done transfusion of blood in eight cases altogether. Of these there were four transfusions in three cases of secondary hæmorrhage at base; one of mine, and two of Major Hill's. Two of these died of repeated hæmorrhages, complicated by septicæmia, and one who was *in extremis* (Major Hill's case) made a brilliant recovery, but, tragic to relate, being sent home well to England, went down on the *Anglia*. At the front I have used citrated blood in four patients; but all have died; two from gas gangrene, and two from the preponderating effect of shock. But in all of these eight cases, except the two with profound shock, the immediate result in colour, pulse, and mental clearness, was quite remarkable, and under more fortunate circumstances it was clear that the transfusion might easily have turned the scale. It may be said that all the cases were in very desperate condition, indeed practically moribund at the time of transfusion.

The Removal of Foreign Bodies

Success in "shrapnel hunting," as it is often called, is not altogether dependent on the perfection of *x*-ray work. One's skill in the purely operative part of it increases with experience. One learns to follow the track of the missile better, and one gradually acquires a knowledge of certain small dodges, scarcely susceptible of description, which lead one to the nest of the foreign body. In spite of accurate *x*-ray localization, in which the unit has been extraordinarily well served by Captain Pirie and Captain Wilkins, and in spite of the best efforts of the surgeons, it must be confessed that a certain proportion of the fragments remain undiscovered. The French have, however, given us a most admirable instrument, the Bergonie vibrator, which has been in daily use in the big hospitals of Paris ever since June, 1915. The instrument is now gradually being adopted by the Imperial and the Canadian Hospitals in France, though not nearly so widely as it deserves. The principle is that of the electric magnet. A large fusiform bundle of soft iron wire attached to a sort of jurymast is suspended immediately over the wound, and the finger of the surgeon is placed on the skin, or in the depths of the wound between this magnet and the presumed location of the foreign body. Then, the current is turned on. The current has to be an alternating one with from thirty to sixty interruptions to the second. As I understand it, the bundle of wire is magnetized with each make of the current, and demagnetized with the break; this constant make-and-break imparts a vibration to the foreign body which is felt by the finger; and the location of the fragment is found to be immediately under the point at which the vibration is most marked. We have only lately installed this instrument, and are anticipating the very best of results from its use.

It is the rule to remove all foreign bodies unless they are of very small size. In such cases it is found that infection very frequently does not occur and the fragment heals in. I have often found that cultures from the bed of a small fragment remain sterile. A striking instance of this is seen in the fragments embedded in brain tissue which, as our experience shows, give rise but rarely to late abscesses. When the fragment is of any size the likelihood of infection is very much greater, and that chiefly because as the fragment becomes larger the tendency towards the carrying in of pieces of cloth and of soil becomes enormously greater. The round shrapnel bullet is much less liable to cause infection than the jagged piece

of shell casing; and the pointed bullet is in the great majority of instances not infected and if necessary can very often be let alone.

Here I must close. I have touched no more than the fringe of things, but time would fail me to go deeper. I would like to say something of the organization of the Medical Service, which, on the whole, I consider admirable; of the magnitude of the provision for treatment of the wounded, which is quite amazing; of the way in which the General Hospitals and the Clearing Stations are run; of the contrast in the nature of the work done by the various Medical Units from Regimental Dressing Stations down to the General hospital, but chiefly of the contrast between Casualty Clearing Stations near the front, General Hospital at Base in France, and General Hospital in England; of the routine work of M.O.'s in Hospitals in France; and of a score of other things which are intensely interesting. But this is impossible for the present. Of one thing, I feel confident, that nowhere among the belligerent countries of either side are the wounds better cared for in every way than in the British Army. And indeed, I beg leave to believe, for myself, that nowhere are they as well provided for.

Some time ago the sum of $50,000 was given by Dr. Douglas, of New York, to the Jeffrey Hale Hospital at Quebec for the purpose of building an annex to the east side of the institution to be used for any medicinal purpose. It has been decided to expend the money on a building for the accommodation of cases of advanced tuberculosis and construction has already been commenced. The building will be 115 feet long by 40 feet wide and three storeys high. Accommodation will be provided for sixteen patients.

THE IRRITABLE HEART OF SOLDIERS (SOLDIER'S HEART)

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IN every campaign there are large numbers of soldiers invalided home with the affection of the circulation commonly called "soldier's heart". This name, however, is not recognised in the official nomenclature of the British army, the cases all being put under the comprehensive title of "Disturbed action of the heart", or, for short, "D. A. H.", which heading includes also all forms of cardiac irregularity.

In spite of numerous series of observations that have been made in previous wars, nothing very positive has been found to account for this condition. All the findings have been rather of a negative nature, and, by the exclusion of valvular and other definite conditions to account for the state, the rather unsatisfactory conclusion has often been reached that the disease is due to "heart strain".

In recent years instruments of precision for the study of the circulation have been introduced, notably the polygraph, the electrocardiograph and the sphygmometer, and it was hoped and still is hoped that in the present war much light would be thrown on this most distressing and invaliding condition. The war has lasted now for over two years and probably thousands of men have already been invalided home with the trouble, and yet, as regards any new light on the essential nature of the disease, it must be admitted that the results of all the study have so far been disappointing.

Let us first be quite clear clinically as to what is usually meant by "soldier's heart". In a typical case one gets something like the following history: a previously more or less healthy man, probably in early adult life, or at least of military age, finds that he is short of breath on any exertion. He often complains of pain about the præcordium and of palpitation. Frequently he becomes very

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exhausted and often has to "fall out" on the march, and may get dizzy and even faint. As long as he lies down, which, by the way, he can always do, he is comfortable and at ease, but on getting up and especially on any exertion his symptoms come on. After a few days of this he will complain to his medical officer, who will probably send him down to the base through the usual channels. On arrival there he is usually found to be a nervous and pinched-looking individual, and is often below the normal weight. He has no fever and lies comfortably in bed, but frequently has some "indigestion". Probably his pulse, while he is recumbent, will not be fast, and it is regular except for an occasional sinus irregularity. All methods of examination of the heart, including pulse tracings, will yield negative results, except that there are often some "functional bruits" present. There are no signs of broken compensation, such as œdema and cyanosis, with an exception to the latter that the extremities are usually cold and rather blue. After a few days the M. O. will probably let him up and then he may be noticed to be dizzy and faint and the nurse will take his pulse and finding that it is running very rapidly will send him back to bed. If now the pulse be taken in various postures and after exertion it will be found to vary greatly, so that, while in the recumbent posture it may be only 75 or so, when the patient sits up it may be 100, and when he stands it may run at 120 or more. Slight exertion, such as walking up and down the ward three times (our usual test) may still further increase the rate, although occasionally it may not do so and may even cause it to slow slightly. The most crucial test seems to be the taking of the pulse in the standing position.

The general rule in the base hospitals in France is that a patient who is not likely to be fit for at least light duty or convalescent camp in three weeks and yet is fit to travel must be sent to England, and so a case as well-marked as the above will probably go there. The two following cases are examples af the typical condition.

Case I. Private B., aged twenty. Occupation before enlisting, farmer. Complains of breathlessness on any exertion and of pains about the left chest. History: had illnesses of childhood and several attack of sore throat since. Often gets cold in the head. Does not drink and smokes moderately. Condition came on gradually. Is a nervous, irritable man and flushes easily. Breathless on any exertion. Lungs and pleuræ seem normal. Heart not enlarged and sounds normal. Pulse is 84 in lying posture, 90 when

sitting, 120 on standing and the same after the exertion test. When it slows again there is marked sinus arrhthymnia. Arteries normal and blood pressure not raised. Marked vaso-motor instability. No improvement in three weeks so was sent to England.

Case II. Private A., aged twenty-seven. Occupation before enlisting, brass polisher. Complaints: weakness and breathlessness on exertion. History: good previous health and always stood exertion well and played games. Came to France six months ago and about three months later gradually began to find that he was short of breath on any exertion and head would swim. Moderate smoker and drinker and never chewed cordite. Patient looks healthy, but nervous. Is deaf, and this is reported to be nerve deafness by our nose and throat specialist. Always has been a little deaf but is much worse lately. Is breathless on any exertion, even such as merely sitting up in bed. Then complains of pain about heart and of palpitation and seems greatly exhausted. Heart appears to be normal in size and in sounds and there is no irregularity. Pulse rate is, on lying, 80; sitting, 95; standing, 125; and on exertion, 140. Urine sterile and all systems appear to be normal. Was sent to England.

And what becomes of these cases? Evidently very few get back to the front, as during more than a year and a half spent in base hospitals in France the writer has never come across a patient who has previously been invalided to England with a diagnosis of "D. A. H.". So, considering the number of cases that are sent home, there must be comparatively few who return. Recently a special hospital has been organised in London for the study and treatment of these cases, and it is hoped that, by the use of carefully regulated exercises and attention to the general health, etc., it may be possible to get the sufferers fit for full duty in three months. The hospital is under the best of experts, with Sir Clifford T. Allbutt, Sir William Osler and Sir James Mackenzie as consultants, one of them being there every day, but the institution is still in the experimental stage.

The German authorities, it seems, are opposed to special wards and hospitals for these cases and I note that Dr. Poynton in a discussion on this subject last January did not favour the grouping the patients together either in wards or in convalescent homes. Dr. Alexander Morison (*British Medical Journal*, January 29th, 1916) also questions "whether good would result from the collection of such cases in a sanatorium specially devoted to their care."

"The companionship of a man who has lost a leg would be

more conducive to his recovery," he goes on to say, "than that of a fellow-sufferer from neurasthenia with or without subjective cardiac distress."

Personally I believe that the hospital will be of great value in the way of throwing further light on the condition, but the final results as regards the return of the patients to good health are yet to be shown. We must remember that these patients are only human beings, and that the prospect opened up to them is that if they get better they will be sent back to the front. We hear much of the bravery of the British soldier, and all those who have come in close contact with him must recognize his stubborn pluck, but after all, he is, as has been said, only human, and after much experience I can say that the prospect of going back to full duty is not an alluring bait to most. They want at least a while at home. Thus the psychic poise of these patients is all against a quick recovery, and in few diseases does the psychic poise play a greater part than in the unstable heart of soldiers.

Nature of the Condition

"Soldier's heart", as already said, has been attributed largely to strain of the heart muscle. This may possibly have been a common cause in some campaigns, but it is certainly not a usual one in the present one. Trench warfare does not give rise to physical strain sufficient to damage a previously healthy heart muscle, whatever other discomforts it is the cause of.

Nerve strain is a different thing, and no doubt has much influence. To live under gunfire and the prospects of at any moment being struck is a terrible strain on the nervous system. As a result of it we find all kinds of functional nerve conditions, including, naturally, nervous instabilities of the circulation. The heart and vessels are very largely under the control of the nervous system and the rate of the pulse is perhaps a better index of the state of this system than is anything else.

When the whole nervous system is under such tension it will yield, if at all, at its weakest point, and this weakest point varies in different individuals. Thus in one man we find functional paralysis or anæsthesia or choreic movements, in another insomnia, in another emotional disturbances and in yet another symptoms referable to the circulation.

Case III is one which apparently dated from a fright years before.

Case III. Private H., aged eighteen. Before enlistment was a labourer. Complains of breathlessness on exertion and pain about heart. History: since he got a "terrible fright" eight years ago he has been short of breath on any exertion and this has been getting gradually worse during the past two years. He does not drink at all but smokes moderately. He reported sick on account of the shortness of breath. Is a frail youth with several bad teeth. No fever. Heart normal in size and rhythm and there are no murmurs to be heard. Thyroid gland not prominent and the eyes do not project. The urine is normal except that it contains streptococci. The pulse rate averaged on many trials 100 lying, 108 sitting, 128 standing and 144 after exertion. Patient sent to Ireland.

This man had evidently had "soldier's heart" for years before he became a soldier. Of course this case might be claimed as an example of sepsis from the carious teeth, or of *bacilluria*, but the patient was so sure that it dated from the "terrible fright" that he had had years before. The cause of the fright he would not reveal.

It is not necessary for individuals to be actually under fire in order to incur nervous strain. Mere apprehension is a great cause of nerve strain as most people have found in civil life, and if this apprehension is continued long enough and the individual be of a nervous temperament something may give way, and it may be the circulation. And when once such a nervous condition is established it is wonderful how persistent it may be. Take for example the occurrence of Graves' disease from fright or shock or more persistent nerve strain, or hysterical paralysis, which may persist for years. A great many of the cases give a history going back for years, and it is extremely common to find that they have never played games or bicycled because they were "short-winded". Dr. John Parkinson in an enquiry into the cardiac disability of soldiers on active service (*Lancet*, July 22nd, 1916) found that about 50 per cent. of his cases showed such a history and I notice that a German writer (Goldscheider, quoted in the *British Medical Journal*, April 1st, 1916) considers that the condition is "due to muscular and nervous exhaustion, and of the two the nervous element is the more important. In many patients there were predisposing factors, including faulty development, anæmia and neurasthenia. Many had previously suffered from palpitation, while others had not been able to stand the change from a sedentary occupation to the strenuous life of a soldier." He concludes by saying, "In fact the war has brought into unflattering prominence the ignorance of the medical

profession of a group of symptoms with which a very large proportion of the soldiers in the German army were invalided."

Cases IV and V are examples of this previous instability.

Case IV. Private G., aged nineteen. Collier. History: has always been short of breath on any exertion and been easily made dizzy. He would often feel faint and even really faint. Three months ago had a very hard time during the Loos attack and lay in water and under fire all day long. Since then the least exertion or any excitement causes him to be more easily out of breath and he gets palpitation and has cardiac pain. Very moderate smoker and takes no alcohol. Is easily exhausted and feels collapsed after his heart has been going fast. Is a nervous-looking man. Lies comfortably in bed. Heart normal in size and sounds. The blood pressure is not raised and the vessels are soft. No exophthalmos or goitre. Urine normal and sterile. Pulse rate (average of many countings), lying, 92; sitting, 120; standing, 136; and after exertion, 150. Always quite regular. Sent to England.

Case V. Private S., aged twenty. Miner. History: "has always been a bit short of breath." Often felt weak and had to "fall out" on the march. Does not remember any definite date upon which he became worse nor does it date from any illness. Smokes and drinks moderately. Was admitted to hospital for *impetigo*. Looks well and has no fever. Breathless only on any exertion. Gets much palpitation on exertion or any excitement. No œdema or cyanosis. Heart normal in size, rhythm and sounds. Systolic blood pressure is 120 mm. and diastolic pressure 80 mm. The urine is normal and sterile. No exophthalmos or enlargement of the thyroid gland. Pulse rate, lying, 84; sitting, 100; standing, 116; and after the exercise test, 134. In three weeks the skin had quite recovered but the circulatory condition was unaltered and he was sent to England.

The conclusion seems to be that in very many cases the patient has always had a circulation that is unstable, and any factor such as nerve strain may in these predisposed individuals lead to an exaggeration of the instability.

The excessive use of tobacco is often stated to be a cause of this condition and no doubt in many cases it is one. There is far too much smoking in the trenches. It is often said that the poor fellows should be allowed to smoke all that they want when in other ways they are suffering so much, and, from one point of view, this is right, but it does not affect the influence of nicotine on the

circulation and nervous system all the same. Looking at the matter merely from the health point of view it would be a good thing strictly to limit the supply of cigarettes that go to our troops at the front. The ration is four packages a week, that is forty cigarettes, and this is certainly not excessive, but various kind societies and private friends increase this supply enormously, so that as a rule a man can smoke constantly, and many of them do so, much to the detriment of their health. Still, tobacco cannot be put down as a constant cause of the condition that we are considering, as many of the worst cases occur in non-smokers.

Alcohol can also be even more surely ruled out as a cause, as the supply of it is most strictly limited at the front.

It has recently been suggested by several writers that the underlying condition of the irritable heart is hyperthyroidism. The only positive evidence that I know of is that in some cases of irritable heart an increase of the lymphocytes in the blood has been noted. This occurs of course in many, but by no means all, cases of typical Graves' disease. I have not studied many cases in this respect, so can only take the findings of others, but can most positively state that there is no protrusion of the eyes nor enlargement of the thryoid gland in the cases. These signs we have constantly looked for and failed to find. There is commonly some tremor but it is not of the very fine type that occurs in exophthalmic goitre.

T. Lewis and T. C. Cotton wrote to the *British Medical Journal* of November 13th, last stating that they had found an almost constant *bacilluria* in these cases, and they hence attributed the condition to this sepsis. The organisms found were streptococci and staphylococci. In eighteen out of twenty cases they were found to be present. We tried to find these organisms in all our well-marked cases and almost always failed. The routine was to have first of all a specimen passed into a sterile phial under aseptic precautions. If this gave any growth then another specimen was taken *per* catheter and the organism again searched for by culture. In nearly every case the results were negative, and hence I can say most positively that the unstable heart of the soldier is not associated with, much less caused by, a *bacilluria*. In one typical case however (Case VI), we found streptococci in the urine on three separate occasions.

Case VI. Private B., aged twenty-five. Printer. Complains of breathlessness on any exertion and of pain in the left side. History: previous health fairly good, but a ways short of breath on exertion. No serious illness. Came to France ten months ago

and health good until three weeks ago when he was taken with pain in left chest on any exertion, but not on breathing. Smokes moderately and scarcely drinks at all. Breathlessness is not worse since the pain started. Looks well. Dyspnœa on any exertion, but no pain now. No special palpitation and no special sense of exhaustion. Heart normal in size and rhythm. A slight systolic murmur in the third left space. Arteries soft. Systolic blood pressure 168 mm. and diastolic 100. No cyanosis or œdema. No exophthalmos or goitre. Pulse (average of many counts), lying, 100; sitting, 110; standing, 128; and after exercise, 140. The urine on the three occasions that it was so examined (twice from catheter specimens) contained a pure growth of staphylococci. Sent to England.

In Case III streptococci were found in the urine. These are the only two examples of a *bacilluria* that we had among many trials.

Pyorrhœa alveolaris is very common indeed among soldiers and to it has been attributed the common cardiac instability, but as far as we could make out there seemed to be no relationship between the two conditions.

Sir James Mackenzie believes that in most cases the condition is an evidence of "poisoned heart", due to some infection, and it is not difficult to produce examples where the state does date from some such infection. Such a one is Case VII.

Case VII. Corporal H., aged twenty-two. Had always had good health before but about four weeks ago was suddenly taken with headache, vomiting and pains in the back. Also had some diarrhœa. Since then gets breathless on any exertion and feels uncomfortable in the chest. All examinations give negative results. There is no fever and the urine is normal and sterile. The pulse averages 80 when lying, 94 on sitting, and 134 on standing and he feels giddy and faint. Exertion was not tried as he seemed too ill. Was sent to England.

But Sir James writes to me as follows: "I am not at all certain but that a good many people get the same condition without any infection at all, as we have had one or two cases in which I found that only prolonged exertion and sleepless nights seemed to induce it. Moreover, your case, "J. G.", seems to be suffering much like the others and the cause, as you suggest, was fright."

To my mind the condition called "soldier's heart" is not an entity, like for example *grand* or even *petit mal*, but is a high degree of instability of the cardiac, and indeed also the vascular, neuro-

muscular apparatus, and is in reality part of a general nervous instability, in other words,—neurasthenia. I fully agree with Dr. Alexander Morison when he says (*British Medical Journal*, January 29th, 1916), "The soldier's heart is but an incident in a general neurasthenia or state of exhaustion, and exemplifies the relation of the nervous system to sustained energy in the viscera."

In all neurasthenic conditions the subjective phenomena are more marked than the objective, and one constantly notes in these cases of irritable heart that the complaints are not proportional to the pulse rate or the evident dyspnœa. Thus one man, with a pulse rate of say 110 in the standing posture, may complain of feeling quite incapacitated, while another whose heart is running at say 130 may feel comparatively well. All of which tends to show that the real trouble is more nervous than cardiac.

And one gets every degree of circulatory stability and instability, from the man who is unusually stable up to him who is so unstable that any change of posture even, let alone any exertion, produces breathlessness, palpitation and exhaustion, accompanying a fast heart. This conclusion has been arrived at only after the study of a large number of patients. At first we medical officers in a general hospital in France took pulses in the different postures ourselves, but this was a failure, as the very fact of the medical officer taking a pulse tends to make that pulse run too fast. Most patients in a base hospital in France are longing to get to England, and when the medical officer comes round there is always the hope that it may lead to a trip across the Channel, and this anxiety much affects the pulse rate. So the nurses were asked to do the work and as they are frequently taking pulses in any case the pulse rates were found not to be so high. They were instructed to make a list of "up-patients" and at different times in the day to fill in the pulse rates in the different postures and after a definite amount of exercise, which was always walking up and down the ward three times. The pulses were not to be taken until the patient had been in the given posture for at least two minutes in order to give the heart time to settle down to its rate in that posture. The appended list gives the results. In most cases the pulses were taken many times in the different postures and the rates given are the average of the different results. It will be seen that in many men the pulse is too high even in the lying posture, in a larger number it is too high in the sitting position and in a still larger number it is too fast when the patient was standing. I do not put much weight upon the effect of exercise. Sir James Mackenzie, with whom I discussed this matter, tells me that some years ago he investigated

the effects of exercise in some athletes and acrobats and found that in these men of exceptional physique and training the pulse would often exceed two hundred beats per minute, although there was no distress, and the rate would not reach the normal for many hours afterwards. Still, a healthy heart should quickly return to its normal rate after, at any rate, *moderate* exercise, and any delay in its doing so is a sign that there is something wrong. To my mind the most crucial test of the stability of the circulation is the amount of hastening of the heart rate which occurs when the individual assumes the erect posture. The pulse should always be counted at least two minutes after he has stood up so as to avoid the temporary effect of the exertion involved in assuming the posture.

In the appended list of pulse rates the cases have been roughly arranged in the order of their stability, beginning with the most stable. If different medical men of equal experience were asked to draw the line between the normal and the abnormal they would undoubtedly do so at different levels. From a base hospital far more cases would be invalided to England by one officer than by another. This goes to show, as said, that the irritable heart of soldiers is not an entity but is a certain degree of instability of the circulation, and exactly what degree will constitute "soldier's heart" will vary with the examining officer.

Prognosis

The subsequent history of these cases will largely depend on how they are handled. If they are considered as having "heart disease" and have this repeatedly impressed upon them, a great many will undoubtedly drift into chronic invalidism. If, on the other hand, they are treated as Sir James Mackenzie has strongly urged, as people "run down", and the general health is raised in every possible way and they are urged to take moderate and always gradually increasing exercise, always short of breathlessness and fatigue, then probably the outlook is much brighter and most of them will in time more or less recover. My experience in France has not permitted of my seeing the subsequent history of our cases, except in a few instances by correspondence, but the figures recently given by Dr. Parkinson (*Lancet*, July 22nd, 1916), who has traced thirty-nine cases that were diagnosed as "D. A. H." before being sent to the Casualty Clearing Station at which he was at the time working, show that after an average period of seven months (*minimum* four and *maximum* fourteen) only four were on full duty with no complaints and twenty-two were either no better or were

still in hospital. It will be a most interesting and instructive investigation to follow a large series of these cases and to learn their condition, say, at the end of five years. No doubt this will be done. Dr. Parkinson's cases were all diagnosed as "D. A. H." before reaching the Clearing Station, but many of ours arrived at the Base labelled "asthenia" and probably this is really as good or even a better diagnosis than one directly referring to the heart. It will be noted also that many of the worst cases in our list, judging by the pulse rates, were diagnosed as suffering from quite ordinary conditions, such as scabies and bronchitis.

The consideration of these cases as life insurance "risks" will be an interesting matter. My feeling is very strongly that they are "good lives", as the condition, even if marked, does not seem to tend to shorten life. Insurance companies will, however, naturally be guarded in their acceptance of them for some time.

Treatment

Where the cases vary from those that are practically normal to those who are completely incapacitated, the treatment must naturally vary accordingly. If every man that complained of weakness, palpitation, some breathlessness and dizziness was considered as being a case of "soldier's heart" and was accordingly invalided, there would be a terrible casualty list in the army. The great majority of the cases are so slight that all that is required is a few directions about the general health and a firm but kind assurance that the heart is all right and that they can return to duty. The more severe cases require rest to begin with, but must soon be got up and urged to take exercise, this always being well within their capacity. The value of games is much emphasized by Sir James Mackenzie and everyone knows how much easier it is to thus get exercise than merely to take it as a medicine, so much a day. The return to health will always be slow and the patient needs to be constantly encouraged. "We must avoid," as Sir James Mackenzie well says, "the grievous injury that is done to the sick soldier by emphasizing in his mind the depressing idea that he suffers from an affection of the heart." That is to say, we must assure him that he has not got "heart disease", a term which suggests to the laity a downward course and the great chance of sudden death.

Any possible source of sepsis, such as *pyorrhœa alveolaris*, should be attended to and the digestive tract must be carefully looked after. The diet should be simple and nutritious, and tea, tobacco, alcohol and meat should be greatly restricted.

Drugs, beyond those suitable for special needs such as constipation and anæmia, are of little value. Digitalis seems to have no influence in such cases. We have tried it in full doses repeatedly without producing any appreciable effect. Bromides, especially the strontium salt, are of some value when the nervousness is marked.

Two special treatments have been advocated by enthusiasts for this condition, viz., hydropathy and the use of the *x*-ray to the thyroid. They may have some value, but so far no series of cases have been published in support of them.

Conclusions

1. The condition called "soldier's heart" is not an entity, but includes merely the worst examples of a circulatory instability that grades up from the nearly normal to a degree so great that it may completely incapacitate the patient.

2. This circulatory instability has often been there before and is merely brought into prominence or exaggerated by the unusual physical and mental surroundings of a soldier's life. The very same condition occurs, only more rarely, in civil life.

3. In many cases the condition appears to be caused or precipitated by infection with consequent toxæmia, also by nerve shock or strain, but in many instances no such clear origin can be traced.

4. The condition appears to be essentially one of neurasthenia in which the circulatory apparatus happens to show the most symptoms

5. The best test of the degree of the condition is to take the history, in conjunction with the pulse rate when the patient is standing.

6. The treatment is not that of ordinary heart disease, but should be directed to in every way increasing the general tone, including the mental tone, of the sufferers.

7. The patients should not be told, or allowed by our bearing towards them to think, that they have "heart disease", as such is not strictly the case, and such a belief does much harm.

8. The prognosis in well-marked cases must be guarded, but the great majority of cases bad enough to be invalided home will probably not be fit for "full duty" for a long time, but will in time be quite capable of doing "light duty".

9. The ultimate fate of the bad cases (after years) still remains to be investigated.

Disease	Age	Temp.	Average Pulse Rate			
			Lying	Sitting	Standing	After Exercise
Rheumatism	24	97·4	64	74	76	108
Rheumatism	44	98·6	64	64	72	84
Myalgia	30	98·0	68	70	74	98
Rheumatism	24	98·0	64	76	76	108
Lumbago	30	nor.	72	78	80	88
Rheumatism	20	98·0	70	72	80	88
Debility after pyrexia	33	98·0	74	76	80	82
Influenza	45	98·4	70	80	80	84
Influenza	39	98·0	60	74	80	120
Phthisis	26	98·6	72	76	80	106
Bronchitis	35	97·6	70	78	80	108
Influenza	34	97·6	60	74	80	120
Bronchitis	37	98·4	72	78	80	114
Bronchitis	37	98·9	80	82	82	120
Bronchitis	37	98·0	82	82	82	110
Jaundice	22	98·2	78	80	82	84
Bronchitis	22	98·2	64	70	84	120
Bronchitis	46	98·0	74	82	84	90
Debility	20	98·4	70	80	84	105
Rheumatism	20	98·6	72	80	84	88
Bronchitis	22	97·8	64	70	84	124
Neurasthenia	21	nor.	80	92	84	101
Influenza	22	98·1	76	78	85	104
D. A. H.	32	98·4	80	80	88	98
Rheumatism	20	98·9	80	84	88	108
Bronchitis	37	98·0	75	84	88	108
Rheumatism	34	98·8	76	86	88	92
Myalgia	22	99·2	80	86	88	116
Influenza	19	99·0	84	84	88	104
Bronchitis	37	98·2	68	78	88	104
Nephritis	24	nor.	80	80	88	92
Rheumatism	38	nor.	68	78	88	92
Rheumatism	45	98·6	68	80	88	92
Epilepsy	29	nor.	78	84	88	128
Enteritis	20	98·0	84	88	88	96
Influenza	24	98·0	80	84	88	96
Nephritis	36	98·4	72	80	88	100
V. D. H.	22	98·2	84	88	88	132
Myalgia	29	97·0	82	86	88	112
D. A. H.	—	nor.	78	89	90	104
Tonsillitis	18	nor.	76	82	90	108
Gastritis	29	97·0	62	86	90	106
Rheumatism	23	96·0	88	90	90	102
Myalgia	50	99·0	80	82	90	118
Influenza	24	nor.	80	80	92	96
Influenza	41	97·4	80	88	92	100
Bronchitis	35	97·6	70	80	92	108
Debility	—	98·6	78	80	92	112
Bronchitis	21	98·6	72	80	92	120
Bronchitis	38	98·6	72	88	92	100
Rheumatism	40	98·0	78	88	92	100
Influenza	19	98·6	88	90	92	112
Debility	31	97·8	88	90	92	124
Bronchitis	20	98·0	72	80	92	120

Disease	Age	Temp.	Average Pulse Rate			
			Lying	Sitting	Standing	After Exercise
Debility	31	98·0	84	87	94	112
Bronchitis	24	97·4	80	84	94	100
Lumbago	21	nor.	78	85	94	97
Bronchitis	32	97·0	78	84	96	116
Gas poisoning	22	nor.	68	84	96	112
Eczema	24	98·6	68	92	96	108
Rheumatism	38	98·3	76	92	96	100
Headache	48	98·0	86	92	96	120
Influenza	22	98·2	78	84	98	112
Bronchitis	32	97·0	76	84	96	116
Myalgia	50	98·0	80	84	96	108
Headache	48	98·6	88	92	96	108
Dental caries	30	97·6	72	84	96	108
Influenza	23	99·0	78	84	98	126
Influenza	33	98·6	78	88	98	104
Scabies	20	nor.	78	82	98	110
Debility	30	nor.	78	94	98	110
Headache	40	98·0	86	92	99	116
Rheumatism	26	nor.	70	86	99	133
D. A. H.	20	nor.	71	80	99	125
Malaria	39	nor.	78	96	100	116
Neurasthenia	22	98·2	76	88	100	120
Lumbago	24	97·6	86	90	100	110
Debility	20	98·8	84	84	100	124
Nasal catarrh	32	98·0	78	88	100	120
Influenza	22	98·4	88	92	100	104
Rheumatism	22	98·6	80	88	100	116
Chronic Diarrhoea	31	98·2	84	88	100	124
Influenza	23	99·0	74	84	100	106
After pyrexia	18	98·0	84	92	102	104
Myalgia	25	98·8	86	90	102	105
Myalgia	24	98·2	82	96	102	108
Debility	—	nor.	85	89	103	127
Diarrhoea	28	nor.	81	93	102	104
Influenza	23	nor.	80	90	103	110
Influenza	24	98·6	68	84	104	112
Myalgia	29	98·8	96	100	104	112
Tonsillitis	24	98·2	76	92	104	138
Colitis and Debility	34	nor.	86	91	104	132
Influenza	32	nor.	88	100	104	142
Bronchitis	—	nor.	92	96	104	120
Debility after influenza	24	nor.	72	82	103	108
Debility after trench fever	21	nor.	88	92	104	108
Bronchitis	48	nor.	84	94	105	118
Influenza	20	nor.	90	92	105	117
Myalgia	34	nor.	85	93	106	123
Debility	21	nor.	82	90	106	121
Myalgia	21	nor.	85	91	106	110
Debility	28	98·0	73	86	106	116
Rheumatism	35	98·0	72	84	108	120
Bronchitis	35	98·0	72	80	108	126
Bronchitis	25	98·2	92	94	108	96
Bronchitis	36	98·4	72	80	108	120
Bronchitis	22	97·4	80	84	108	112

Disease	Age	Temp.	Average Pulse Rate			
			Lying	Sitting	Standing	After Exercise
Impetigo	28	nor.	91	101	108	160
Influenza	27	nor.	89	91	109	110
Rheumatism	23	nor.	93	103	109	119
Myalgia	22	nor.	80	100	110	118
Bronchitis	30	99·0	98	100	108	112
Influenza	34	97·2	72	88	112	118
Rheumatism	22	97·6	88	98	112	140
Epilepsy	34	98·0	94	98	112	106
Malaria	44	98·8	76	100	112	118
Rheumatism	27	97·6	68	96	112	140
Bronchitis	24	97·4	84	92	112	132
Debility	22	nor.	84	94	112	124
Debility	17	nor.	83	94	113	130
D. A. H.	21	nor.	94	101	113	122
Influenza	25	nor.	105	106	113	122
Chronic diarrhoea	28	98·4	74	100	114	118
Bronchitis	30	99·0	96	108	114	120
Influenza	33	98·8	96	100	114	112
Bronchitis	29	99·0	96	106	114	120
Influenza	23	nor.	87	96	114	126
Debility and defective teeth	39	nor.	100	109	118	125
Debility and defective teeth	38	nor.	90	96	116	140
Myalgia	31	nor.	92	104	113	114
Influenza	33	nor.	94	114	118	128
Gastritis	—	nor.	100	108	116	124
D. A. H.	23	nor.	96	110	116	124
Influenza	26	97·0	80	94	118	124
Influenza	33	nor.	94	114	118	128
Debility	26	nor.	105	110	119	122
Influenza	—	nor.	92	100	120	124
Con. pneumonia	21	98·3	92	100	120	132
Impetigo	30	nor.	87	104	118	136
Impetigo	24	nor.	97	107	118	141
Seborrhoea	26	nor.	91	103	117	135
D. A. H.	20	nor.	104	112	120	140
Myalgia	25	nor.	88	104	122	126
Bronchitis	24	nor.	102	112	122	133
Neurasthenia	23	nor.	94	105	123	141
Myalgia	25	nor.	90	99	124	101
Influenza	23	98·0	90	98	124	136
Myalgia	26	nor.	100	100	126	128
Scabies	22	nor.	98	110	130	154
Catalepsy	25	nor.	103	121	130	137
Gastritis	27	97·2	128	128	132	144
Debility	22	98·8	76	104	142	...
Average Rates (all cases) 153	..	....	83	94	106	116
Average Rates of the "D. A. H." cases	..	....	89	98	108	125

THE FIELD AMBULANCE AND ITS ORGANIZATION

By Walter L. Watt, M.D.

Lieutenant-Colonel, C.A.M.C., Officer Commanding Granville Canadian Special Hospital

A FIELD ambulance, as a unit, should be characterized by: *First, Elasticity.* The number of wounded and sick it may be required to look after varies from zero to infinity. It is only supposed to be equipped for one hundred and fifty patients, but in times of stress this number will be multiplied many times over, our highest number of admissions being twelve hundred and fifty in twenty-four hours.

Second, Harmony. There must be no working at cross purposes. Every officer and every man must have his own particular work to do, and there should be no interference whatever with such duties.

Third, Inter-co-ordination. Each section should not only be fully qualified to relieve any other, at any time, and at any work, but within itself each half tent or half bearer sub-division should likewise be able to relieve the other no matter what the work may be.

Fourth, Efficiency. It is taken for granted that the officers are fully qualified in their profession, but there is no one more hopeless in a field ambulance than an officer who is purely a physician. The work of a field ambulance depends entirely on the military efficiency of the personnel, the rapidity with which the bearers collect, load and unload patients, with which the tent orderlies prepare the wounded for the hands of the surgeon, the celerity of the orderlies in bandaging and assisting when the great rush is on, the organized marshalling of ambulances pouring in and out with their loads of wounded, the proper and careful checking of patients, the systematic feeding of the wounded, many of whom have not tasted food for twenty-four to forty-eight hours. These

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are all factors in determining the wastage in output of work for the energy expended.

Fifth, Foresight. Trouble comes like a thunderstorm on the clearest of days. Only a few minutes warning and the cloud bursts and it behoves us not to be caught napping. Quartermaster's stores, medical supplies, stretchers, blankets, disappear like ether in an open cup. In their place rifles, equipment, great coats, bayonets and junk of all kinds pour in, until it seems as if it would need the Crystal Palace to hold it all.

Sixth, Adaptability. Its quarters are as varied as the bits of glass in a kaleidoscope. Perchance the open fields, a tumbledown insanitary farmhouse, a church, a school house, a granary, a factory, a seminary, rarely—extremely rarely—a chateau. But no matter what the place or what the accommodation, it may be required, and often is required, to receive patients or wounded within a few minutes of its arrival.

Seventh, Decision. No matter where it may have opened up, a field ambulance is never safe. Time and time again with accommodation crowded, it may suddenly be subjected to shrapnel or high explosive shells. The questions at issue must be decided quickly as the lives of many patients depend upon the action taken. To move or not to move is often the question. Has a suitable place, convenient for carrying your stretcher cases been previously located? Has a shelter been erected where the most serious cases can be conveyed? It is almost a maxim that if the shells once come the recurrence will be more and more frequent. Main roads and cross roads are exceedingly dangerous places, but of course it is not always possible to avoid the use of these, as the choice of suitable buildings is limited and the necessity of good roads for the ambulances is imperative. The enemy have often definite hours for shelling. If they miss, look out for trouble, as it will likely come at some unexpected time just when you are full to the limit. Try to evacuate your patients just as quickly as they are dressed. If you are getting overcrowded post an officer—preferably in the road—to commandeer everything possible. Motor lorries, London motor 'buses, motor cars, wheeled transport, nothing comes amiss. It has been our fortune at least, always to find the drivers only too willing to help you out of your troubles to the fullest extent. An omnibus is ideal for sitting-down cases as it accommodates easily and comfortably twenty-five cases, and frequently the day is saved by this timely requisitioning.

The above characteristics are no doubt of academic interest,

but the crux of the situation is the practical application in order to obtain the ideal field ambulance. With this in view the following suggestions are made with the ultimate aim of bringing out criticisms and opinions harmonizing or disapproving as the case may be, from other field ambulances, that thus, in the end, much good may be obtained for all. They are based upon our experience with the 3rd Canadian Field Ambulance.

What is required above everything is an operating room staff, separate and permanent, trained to the very highest pitch in personal cleanliness, in proficiency of treatment and bandaging, in handling of instruments and dressings, in knowledge of panniers' contents and in celerity of movement and work; everyone knowing what to do, and every man whether non-commissioned officer or orderly being duplicated, so that when one half is fatigued the other half can carry on without hitch or hindrance. With the field ambulance as at present constituted this is extremely difficult, if one wishes to give each of the sections an equable share of the work, but by thus making an independent operating staff its members become extremely proficient and in time of stress are invaluable. They are also the means of harmonizing the work of the whole field ambulance since the tent sub-division of each section in turn works under them, and learns the same methods, and thus they can step in to assist at any time without confusion. This also permits of practically all of the sectional equipment being kept closed up, so that the ambulance is ready to move off at a moment's notice if urgently required or if sudden danger arises.

In close association with this are the medical stores, which should be under a man, preferably a corporal, permanently appointed. Here all the reserve dressings, bandages, splints, and medicines are kept. A supply for treating two or three thousand should be constantly here, as when parlous times come there is no time or opportunity for drawing more. There were in addition three boxes kept here for advanced dressing stations labelled A.D.S. 1, 2 and 3. They contained dressings, wool, bandages, splints, scissors, soap, collapsible candle lanterns and iodine. They were of great value, as we had three urgent calls for supplies and were thus able to send them to our advanced dressing station without a moment's loss of time, whereas if they had not been previously prepared it might have been very difficult to supply the necessities in time to be of value.

Equally important are trained ambulance orderlies, ten in all, one for each ambulance. It is astonishing the difference between

a man who has been acting as an orderly for two or three weeks, and one who is doing it for the first time, even if he is a first class stretcher bearer. The preparation of ambulances for stretcher cases, or for sitting, the proper pushing home of the stretcher, the strapping of the stretcher, the disposal of kit are all little things in which the beginner falls down and loses valuable time. So for this reason I am strongly in favour of permanent men, taken from the ranks of the bearer sub-divisions.

Another equally important part of the work is the returns. Accuracy combined with rapidity is of supreme importance, as there is no news more anxiously waited for in the home land than the news relating to the welfare of the soldier who has gone through the battle ordeal. Here again precious minutes may be lost over and over again. The following method appeared to work well—one officer was appointed purely to handle admissions and discharges. It was found impossible to admit them in the ordinary way as the wounded came in by fifties and the call from the sentry at the operating room door for "one stretcher case" or "two sitting cases" and so on, came far faster than it was possible to admit them, so a good clerk was detailed to the operating room to fill in the "specification tally" from information given by the surgeon dressing the case. A rubber stamp previously bought was used for stamping the tally if serum was injected. When red bordered labels ran out red seal stickers previously bought were used to indicate dangerous cases. The stretcher cases were then taken into one place and the sitting-up cases into another. When the convoy came for evacuation one officer in charge with two assistants, each with Army Book 152, then made duplicate lists of the cases as they were put in the ambulances—a separate page for each ambulance. The duplicate was torn out and handed to the driver with instruction to give it to the officer at the Casualty Clearing Station on arrival. There was thus a triple check, the tally on the patient himself, the original in our possession, and the duplicate given to the driver. The same system was followed in connexion with the sitting-up cases, except when word was received that motor buses would be available, then the checkers made lists of twenty-five in duplicate in Army Book 152, and when the 'bus arrived the names were called out and the men paraded and escorted to the 'bus. The duplicate was then handed to the driver. In this way an absolutely accurate record of evacuations and, of course, admissions was kept. These books were collected and handed into the orderly room, one or two at a time, when they were entered into the Ad-

mission and Discharge Book. The fact that we handled five thousand and two hundred cases in six days speaks for the rapidity with which the work was done, and it was practically impossible to miss anyone who was treated and evacuated through the field ambulance. It also permitted our Admission and Discharge Book being kept beautifully clean and legible, which in itself is invaluable for future records.

Again another branch which should have a permanent staff is the quartermaster's. Every patient that passed through our hands, if his condition permitted, received at least one meal,—somewhere in the neighbourhood of eight thousand extra meals were served during these six days. This was only made possible from the fact that the men in charge were ready for all emergencies and able to handle everything in a rapid and satisfactory manner. This equally applies to the pack store, where confusion would reign supreme unless the men in charge were permanent and thoroughly conversant with their duties.

Another branch requiring a head is, I think, the guard. A permanent provost corporal should be appointed, and, detailed to him, one permanent private from each section. These men become thoroughly proficient in their duties, and are sufficient for day work. An extra picquet is detailed daily for night duty. Hours of duty—two on and four off. In rush times they are specially valuable for the control of incoming and out-going traffic to prevent congestion.

This has all been an attempt to justify our formation of a so-called headquarters section—its personnel as follows:

1 Officer Commanding.
1 Quartermaster } Any one of these to be Adjutant; in our case, the
1 Sanitary Officer } Quartermaster.
1 Transport Officer.
1 Sergeant Major (W.O.).
3 Quartermaster Sergeant, Corporal Assistant, one private.
6 Staff Sergeant, Sergeant, four Tent Orderlies, in charge of Operating Room.
1 Pack Store—one private.
1 Medical Stores—one private.
2 Sanitary Sergeant and one private.
8 Transport Sergeant, 3 grooms, and 4 drivers.
4 Orderly Room Sergeant, one clerk, 2 orderlies.
10 Ambulance Orderlies.
2 Cook, Assistant cook.
1 Provost Corporal.
5 1 Lance Corporal and 4 servants.

4 Officers and 44 N.C.O.'s and men.

A, B, & C Sections

Officers	2
Staff Sergeants	2
Sergeants	2
Corporals	2
Cooks	2
Transport Corporal	1
Police	1
Sanitary	1
Tent	16
Servants	2
Grooms	1
Bugler	1
Transport	10
Bearers	24

Each 2 Officers and 65 N.C.O.'s. and men.

A, B, & C Sections	201
Headquarters	48
	249

This rearrangement permitted us to have each man in the headquarters section trained to do certain definite duties. In this way no matter what may arise, I believe, a field ambulance should be able to cope more rapidly with every difficulty as A, B, or C Sections or the whole three can be attached at any time without the slightest confusion and with the maximum of increased usefulness. The depletion of the section does not interfere with its capacity for work, as it is quite easily able to cope with any detached duty for which it might be ordered.

It will also be noticed that the tent sub-division is relatively larger as compared with the bearer. This is, I take it, very important, as men are only human and the limit for efficient work is soon reached unless they are regulary rested. The tent personnel should be large enough to permit of two shifts, one for day and one for night; better work is done, rapidity of work greatly increased. With the bearers this is of considerably less importance as their work is practically all done at night, and it is only extremely rarely that they can all be used on account of the difficulty of transportation. In the great majority of cases, two or three stretcher bearers to each ambulance in addition to the permanent wagon orderly are all that is required.

TREATMENT OF DIPHTHERIA AT THE ALEXANDRA HOSPITAL, MONTREAL

By Drs. H. B. Cushing and E. V. Murphy

IT is now ten years since the Alexandra Hospital was opened to receive cases of infectious disease in Montreal. The writers, having occasion to review the statistics of the diphtheria pavilion for this time, thought that some account of the work done might prove of interest to this society, for the Alexandra Hospital shares the disadvantages of all contagious hospitals. Regarded as a pest-house, a sort of necessary evil, and a place to be avoided when possible, little is known about its management or results by the general public or even of the local medical profession, unless some accident happens. Patients regard it as a place of detention, to be escaped from as soon as possible, and visitors give it a wide berth. Nurses and attendants and even resident physicians are difficult to secure. The main principles of the management of the cases of diphtheria have remained practically unchanged from the original system as elaborated by Dr. A. H. Gordon and Dr. Fyshe who were originally in charge. The cases are under the direct care of the medical superintendent, who has always had special training in infectious diseases, usually in the larger cities of the United States, and are under the supervision of a visiting physician.

Little need be said of the symptoms or the class of cases treated. The percentage of severe infections and of laryngeal cases is higher than in family practice, for hospital treatment is not obligatory in this city and the milder cases prefer to remain at home.

In all, two thousand two hundred and eight cases were treated to a conclusion in the ten years. The pavilion was never closed from lack of cases but the disease seemed to occur in the city in distinct epidemics, three or four years apart. Although there were occasional family or institutional outbreaks, in the majority of cases it was impossible to trace the source of infection, 5 per cent. gave a history of previous attacks of diphtheria. The age incidence

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was interesting and conformed to other published statistics, 2 per cent. of our cases occurred in the first year of life, 6 per cent. in the second year, 5 per cent. in the third year, 9 per cent. in the fourth year, 10 per cent. in the fifth year, and then a steady diminution in the percentage of cases until the fifteenth year, after which only scattered cases occurred up to the sixtieth year. This preponderance of cases before the school age has recently been shown to be due to an increased susceptibility and not to greater exposure at these ages.

As usual the danger of infection to the attendants proved greater than in any other of the diseases treated in the hospital. Fifty-one cases of diphtheria occurred among the attendants and only thirty of all other infectious diseases together. We are pleased to be able to state that there was no fatality in these fifty-one cases, partly due to the diminished danger of diphtheria in adult life but undoubtedly partly due to prompt treatment. No attempt was made to immunize the attendants with prophylactic doses of antitoxin, as it has been the experience of other similar institutions that the benefits of the resulting brief immunity were not in proportion to the discomfort and disability caused by the serum reactions. The Schick reaction promises to be of value in testing the immunity of attendants but so far has not been used for this purpose in the Alexandra Hospital. During the last four years when the attendants have been in better quarters and greater care has been taken of their diet and general hygiene, the number of cases of infection has materially decreased.

In the hospital the diagnosis rests altogether on the finding of diphtheria bacilli by the usual routine of cultures, which are taken of all cases on admission. Owing to the lack of facilities in Montreal for obtaining culture tubes and having them examined, few cases come to the hospital with a history of a positive culture being obtained. Practically only the cases coming from the larger general hospitals have been tested in this way, so the diagnosis before admission is made on the clinical features alone. On the whole the accuracy of the diagnosis thus made has been surprisingly good, comparatively few cases being sent into the hospital by mistake or too late for successful treatment. On the other hand many mild cases are undoubtedly overlooked.

Follicular tonsillitis and quinzy are naturally the greatest sources of error, especially the latter. Scarlet fever is a more serious error of diagnosis and the admitting officer of the hospital has to be continually on his guard against confusing this disease and diph-

theria. Vincent's angina has only rarely been sent to the hospital for diphtheria, only six or eight cases in all. The confusion of retropharyngeal abscess with laryngeal diphtheria is rather more common.

In considering next the prognosis of cases of diphtheria, in spite of modern advances it is still the most fatal of contagious diseases. Diphtheria causes about two hundread deaths a year in Montreal, almost as many as all the other contagious diseases together, leaving out tuberculosis, pneumonia and infantile enteritis. We must remember that the mortality in all published statistics before 1900 was uniformly 30. per cent to 40 per cent. Since the use of antitoxin has become general it has sunk to 10 per cent., but is rarely below this in institutions owing to the large proportion of laryngeal cases. In the Alexandra Hospital in ten years, we have had two thousand two hundred and eight cases with one hundred and sixty-six deaths or $7\frac{1}{2}$ per cent., making no deduction for those dying immediately on admission or those whose death was really due to some other disease than the diphtheria for which the case was admitted. In 1915 there were four hundred and seventeen cases with twenty-one deaths or 5 per cent. The laryngeal cases were as usual the most fatal. There were in all two hundred and five cases where intubation or tracheotomy became necessary and of these fifty-five died or 27 per cent. In 1915 there were thirty-one cases of intubation with five deaths or 16 per cent. Apart from the laryngeal cases there are two groups of cases which always raise the mortality, first, the septic cases, with great swelling of the neck and throat, foul odour and bloody discharge from the nose. Nearly all these improve marvellously for two or three days after antitoxin but die of cardiac failure before the end of a week. Second, the hæmorrhagic cases, where there is a tendency to hæmorrhage from the nose and mouth, with petechiæ, purpura, etc. Of twelve such cases collected, all died.

Turning next to the complications noted in these two thousand two hundred and eight cases. Evidence of cardiac disturbance was reported in one hundred and nine cases, varying from murmurs and irregularity to serious myocarditis; little stress can be laid on these figures as the proportion of the milder cases obviously varies with the observer. Disturbance of the kidneys proved commoner, albuminuria occurred in three hundred and forty-two cases or 15 per cent., with evidence of definite nephritis in one hundred and eleven cases or 5 per cent., this was almost always of mild form and cleared up entirely before the patients left the hospital.

Evidence of peripheral neuritis was noted in ninety-four cases or 4 per cent., usually only a palatal paralysis. Probably this proportion is too low as undoubtedly many of the milder cases occur after discharge from the hospital.

Simple cervical adenitis was of course almost constant but suppuration was very rare, only ten or twelve requiring operation. Otitis media also proved comparatively rare, fifty-one cases being noted or 2½ per cent., possibly careful treatment had something to do with prevention of this complication. Pneumonia or broncho-pneumonia was noted in seventy-two cases, mostly laryngeal cases, but here again accurate diagnosis from bronchitis is difficult and may influence the figures. Relapse or re-infection before leaving the hospital occurred in one or two cases each year.

Finally, as to the principles of treatment as carried out in the Alexandra Hospital. I need scarcely say that antitoxin is regarded as an absolute specific for the disease by the entire staff, the only cases lost being those received too late or those with some fatal complication. The serum is given with the ordinary precautions in the subcutaneous tissues of the abdomen. Serum from all the larger manufacturers has been used, and there has rarely been any difference noted in the effects. Of recent years we have come to use the serum globulin altogether as more convenient, less bulky and less apt to give serious serum rashes. Recently, following the example of workers in the United States, we have tried giving the serum intramuscularly and intravenously. The latter method is undoubtedly more rapid and certain, and requires a smaller dose. On the other hand it is more apt to give serum sickness and is difficult of execution in patients of the usual age. We have not had enough cases to make our statistics of any value, but can only say that so far we are convinced the method has a distinct future.

As to bad results of antitoxin, we can find no record of true anaphylactic shock and death in the Alexandra Hospital. No special selection of cases or precautions have been taken to prevent this remote danger. Ordinary serum sickness, i.e., urticaria, with occasional fever, pains, vomiting and enlarged glands occurs frequently, in nearly 20 per cent. of the cases. It is much commoner with some sera than others, and apparently especially so with very fresh serum. It is rarely very distressing except with adults. None of the various antidotes recommended, e.g., calcium lactate, adrenalin, etc., have proved of much avail in our hands.

The Schick reaction, that is, the intradermal use of diphtheria toxin as a test for susceptibility, has been used during the past year.

It will probably prove of great value, but has to be carefully controlled as one is apt to get negative results if the toxin is not absolutely fresh.

The question of the dosage of antitoxin is of primary importance, and this is the first question asked by all physicians visiting the hospital. The usage in this respect has practically not varied since the hospital opened. The rule has been to be guided, first, by the extent of the membrane; second, by the duration of the disease; third, by the occurrence of serious symptoms such as toxæmia, laryngeal stenosis, rapid spread of membrane, etc. No special difference is made by the age or weight of the patient. We endeavour to give one large dose on admission, and repeat only in serious cases, or if the membrane extends subsequently or if there is no improvement in twenty-four hours. In one thousand consecutive cases, one dose only was given in 70 per cent., while 30 per cent. required one or more additional doses. The usual rule has been to give 3000 or 4000 units in mild and early cases, 6000 or 8000 units in more serious cases, or when the disease has lasted over forty-eight hours, 10,000 or 12,000 units in all very serious cases. In one thousand cases the average total dose was between 6000 and 7000 units.

Compared with modern usage in some hospitals these are moderate doses, but we have almost invariably found these doses to control the disease, and have very rarely regretted the small size of the dose. We consider that our low mortality has justified our dosage.

As the city of Montreal does not manufacture antitoxin or supply it to deserving cases, the cost of serum used is a very large item in the annual expense of the hospital.

As to the other details of treatment apart from the use of antitoxin, the one essential insisted on is to preserve the strength of the patient in every possible way. The patients are disturbed as little as possible. To cleanse throats we use mostly Dobell's solution, rarely using any nasal or throat irrigation.

Absolute rest in bed for ten days in all cases is insisted on. The diet is at first milk and then soft foods until the patient is allowed up. Any sign of paralysis or myocarditis is treated by continued absolute rest.

Ice-collars are used for adenitis, usually applied two hours on and two hours off.

After two weeks discharge cultures are taken and the patients discharged after two negative cultures. The average stay in the hospital was twenty days.

The most interesting and fatal group of cases is the laryngeal. Practically all are young infants and most of them are admitted *in extremis*. The disease is commonly mistaken for ordinary croup, and the patient only sent to the hospital when asphyxiating; 65 per cent. of our intubations were performed immediately on admission. Our rule has been to give 10,000 units of antitoxin and place the patient in a steam-tent. Only rule for intubation has been to withold it until we think there is danger of asphyxia; restlessness, cyanosis, and marked retraction of the chest being the guides. If we can avoid intubation for twenty-four hours, it is very exceptional that it has to be performed later. We remove the tube usually in three days, being guided by the temperature, pulse and general condition of the patient. Once the tube is inserted the treatment is the same as the other cases of diphtheria. There are three special dangers in tube cases; first, coughing up the tube, which is rarely dangerous in a hospital as it is easily replaced; second, blocking of tube by membrane, which is rare in our experience; third, ulceration of the larynx leading to stenosis later, only occurring in three cases which we were able to trace.

Tracheotomy has only been performed in extreme cases where intubation has failed for one reason or another. The statistics show thirty-three cases with twenty-seven deaths, the high mortality being explained by the class of cases, the operation being only performed as a last resort.

A PRIZE of fifty thousand francs is offered by the Société Nationale de Chirurgie to the maker of the mechanical apparatus supplying best the place of the hand. All competitors must belong to allied or neutral nations. They are to present to the Society mutilated men who have been using their apparatus for at least six months, and the Société de Chirurgie will experiment each apparatus on mutilated men for the length of time it thinks fit. The apparatus rewarded is to remain the property of its inventor. The competition will be closed two years after the end of the war.

The sum of money mentioned has been offered to the Société Nationale de Chirurgie and the matter has been placed in the hands of a committee consisting of MM. Faure, Kirmisson, Quenu, Rieffel and Rochard. Competitors should send memoir and apparatus to the General Secretary of the Society, 12, rue de Seine, Paris, France.

Editorial

COLDS EXPLAINED

THE view that common "colds" are due to infections of the upper respiratory tract has long been held. Although ascribed to various organisms, a bacterial cause for "colds" has not been demonstrated up to date, notwithstanding the great amount of careful work done in pursuit of this object. The "paucity of bacteria" in the nasal and other secretions and the short time over which bacteria may be demonstrated are against the view that they are a causative factor.

Having failed to demonstrate living organisms in the filtratos of nasal secretions which produced colds in 42 per cent. of cases when instilled experimentally on the nasal mucous membrane of the human subject, Kruse concluded in 1914 that the causative organisms should be classified with filterable viruses.

George B. Foster has recently published a preliminary note setting forth the results of his experiments along similar yet somewhat different lines. Foster states that inoculation or instillation of the filtrate of the nasal secretion was followed in a considerable proportion of cases by the development of the usual symptoms of acute coryza, etc., lasting from three to six days. These filtrates were sterile by the ordinary bacteriologic methods. So far the work, in method and results, corresponds to that of Kruse. "The successful cultivation of the parasite of rabies by Noguchi and the causative organism of poliomyelitis by Flexner and Noguchi, suggested the application of methods similar to those of Noguchi in attempting to grow an organism from the nasal secretion filtrates." Microscopic examination of cultures thus made failed to demonstrate with certainty bacterial forms, though

"minute coccoid bodies and occasional rodlike forms" were found in "all preparations but not in sufficient numbers to preclude the possibility that they were artefacts."

Following upon this step, which may be regarded as a failure, inoculation experiments were made with the cultures. In a dilution of at least 1 to 90,000 the fluid was instilled on the nasal mucous membrane of eleven soldiers with a positive result in all—though the symptoms varied in degree.

Foster commenting on his results says it seems logical to conclude that common colds are infectious, that the causative virus occurs in the nasal secretions and that this virus is capable of passing through a Berkefeld N. filter which has proved impermeable to ordinary bacteria. He maintains at the same time that the cultural experiments suggest that a virus from the nasal secretions of persons ill with colds has been cultivated in vitro. As favouring this interpretation of the experimental results, the following facts are adduced: (1) As the filterable constituents of the original nasal secretions were in dilution 1 to 90,000 and more, it is beyond the realms of imagination that any toxins, virus or enzyme originally existing in the secretions could have been carried over mechanically, and, in this high dilution, have exhibited pathogenicity. (2) The cultures showed changes ordinarily interpreted as indicative of bacterial growth. (3) The changes observed in the original cultures were intensified in successive cultures. Dr. Foster reserves the assertion that a virus has been cultivated until additional evidence is forthcoming.

The relation of atmospheric humidity and low temperature with draughts and winds to nasal catarrh and "colds" is discussed by Leonard Hill. It is claimed by this eminent physiologist that out of doors under favourable conditions the normal mucous membrane of the nose is pale and taut. It does not pit when pressed with a probe and it is free of thick secretion. The head cools quicker than the feet except under the conditions of cold, wet ground or thawing snow. Indoors the conditions are often quite different, cold floors and poor ventila-

tion with all the heat about the head. The mucous membrane of the nose is red and lax and boggy, pitting on pressure and bearing in its surface a thick tenacious secretion. The head feels stuffed, due to the circulation through the mucous membrane and the secretion of the mucous glands being in excess. The changes from bad indoor conditions to the cooler temperature of out of doors favours "catching of cold". The germ or virus causing the cold prevalent in the crowded apartments fixes upon an unhealthy mucous membrane or the secretions found there and so gains a hold.

The washing away of bacteria or whatever causes the nasal membrane to react as it does in "*taking cold*" is one of the most important methods of defence, depending as it does upon the outflow of lymph, which is again dependent upon blood flow through the nasal vessels and the rate of evaporation possible from the nasal membrane. In changing from warm infected rooms to cold atmospheres severe demands are made upon the circulatory and evaporative mechanisms of the nose, and if the outflow of secretion is not sufficient to wash away bacteria for defensive purposes the individual "takes cold", or is infected through the nose. Cold checks evaporation. Humidity checks it also—hence mist and fog check evaporation.

Cold dry air quickens the circulation, favours evaporation and thus is a preventive to "taking cold". The greater the circulation through the nose and the greater the evaporation from the nose the greater the immunity to infection.

WAR SURGERY

WE publish this month a paper from Major E. A. Archibald that is of more than passing interest. It is a record of a considerable experience in the acute war surgery, carefully observed. Clearly related, it gives evidence of much thought and consideration of a few of the problems presented to the surgeon working in France.

His experience in the treatment of the acute abdomen shows that progress is being made. It becomes more and more evident that many of the cases can be saved by laparotomy, and that surgical interference to be effective should not be too long delayed.

Dr. Archibald like many others is labouring with the great question of shock, its nature, its causes, and its pathology. We have come to a considerable extent to regard shock on the operating table in civil surgery as closely allied to hæmorrhage. There is a great measure of truth in this teaching. It is clearly not the whole truth. What is shock? No answer yet given has met with general acceptance. Sherrington and Crile have put forth one view, clear-cut and definite: R. A. Kocher presents evidence that does not at all support Crile's views. His experiments do not show any constant change in nerve cells or their nuclei as a result of extreme fatigue or fear. We cannot, however, read the experiences presented in Dr. Archibald's paper without feeling that nerve tissue suffers in shock and that loss of nerve tissue function has something to do with its continuance.

The far-reaching, penetrating destruction of brain tissue in bullet wounds of the head has been referred to by several surgeons during the present war and it has demanded and is receiving special treatment. The particular therapeutic indications, when properly met, are followed in many cases by happy results. The point seems to be to remove at an early dressing all the visibly discoloured and altered tissue to a sufficient depth and in a definitely limited area.

The universal testimony of those in a position to judge is that the organization of the Royal Army Medical Service is wonderfully efficient in all departments. Never in any previous war have the Army and the Navy received as good, prompt, scientific, and efficient medical care.

The treatment of wounds has of course received a great deal of attention during the present war. The first great lesson learned was that of the care of injuries to the soft tissue

as well as to the bones and joints. Aseptic surgery had no place. Surgeons very soon found that they must return to antiseptic technique—to the principles laid down by Lister. The ideas and methods of Sir Almroth Wright have been tried, and judging from reports that have appeared in the medical journals, opinions are divided as to their value. It is perhaps correct to say that his methods are complementary to the technique of antiseptic surgery, i.e., that they are adapted to the treatment of wounds that have already been thoroughly cleansed by antiseptics and to a later stage of wound treatment.

The August number of *The Modern Hospital*, St. Louis and Chicago, is devoted to a symposium on welfare work among the industrial corporations of the country. There are editorials by those competent to write on this important subject, a number of papers written by welfare directors in some of the most important industrial corporations, and statistics, figures and facts showing the large volume of work that the corporations are doing to protect their employees against sickness, accidents, and discontent. The journal contains illustrations of first aid stations, emergency hospitals, and welfare departments of industrial plants, and many facts that should be of help to those interested. Among the topics discussed are those of first aid, industrial nursing, lunches and diets for industrial employees, safety devices in factories, and athletic and social clubs for employees.

An attempt has been made by the editors to weed out those features of industrial welfare that they believe undesirable and to emphasize those that seem to meet the present needs of the American public.

An appeal for a National Memorial Fund to commemorate the late Lord Kitchener was made by the Lord Mayor of London on July 14th and met with an immediate response, a sum of eighteen thousand pounds being contributed by noon

the following day. The income from the money thus obtained is to be devoted in perpetuity to providing for officers and men of the Royal Navy and Army (whether in endowed homes or in their own homes) who have been disabled and whose pecuniary circumstances preclude them from obtaining such attention and comforts as they need. A portion of the Fund will be applied immediately to the equipment of a home for disabled officers for whose assistance nothing of a permanent nature has yet been considered. It has been the desire that the memorial chosen should be permanent and should perpetuate Lord Kitchener's name for all time and that it should be devoted to some object in which Lord Kitchener was known to be particularly interested. No more fitting object could be found than the promotion of the welfare of the King's Forces throughout the Empire. When the war is over many of the institutions recently founded for the assistance of disabled officers will cease and the majority of such officers will have to live on a very slender income.

A REPORT on venereal disease has been issued by the Departmental Committee appointed to enquire into the causes of death and invalidity in Australia. It is estimated that during the year 1914 over seven thousand deaths occurred in the Commonwealth which were due directly or indirectly to syphilis, and no less than 3,326 infants died shortly after birth from congenital debility, icterus and sclerema. At the Australasian Medical Congress the assertion was made by Dr. P. B. Bennie, that at least 25 per cent. of the sick children of Melbourne were syphilitic, and that about 10 per cent. of the total number of children in that city were syphilized; he had found in his experience that 60 per cent. of the children suffering from tubercular meningitis were syphilitic and that no less than 14 per cent. of three hundred families attended by him were infected. The recommendations of the Committee were divided into those that are educational and those that deal with the provision of means of

diagnosis, treatment and control. The authors are of opinion that the education of the masses devolves principally upon the medical profession and that the continued education of the profession itself is a prime essential. They consider that instruction should be given to every boy and, in certain cases, to girls also. Free laboratory tests should be available for the proper diagnosis of all cases and free treatment should be open to everyone. Special clinics should be established at the hospitals and special hospital provision should be made at once for infected seamen. The licensing of houses of ill repute and prostitutes is not recommended. The majority of the provisions of the Western Australian Medical Act are advocated as measures advised for the purpose of restricting venereal disease. This Act was passed last December. It provides that all affected persons shall place themselves under treatment, that the medical practitioner shall give notification of the age and sex of every patient treated by him for such disease but shall not disclose the name of the patient unless such patient fail to return to him for treatment for six weeks, in which case he shall notify the Commissioner of Public Health of the name and address of the patient. The treatment shall be continued until a certificate of freedom from venereal disease is given, the patient reporting to the doctor at least once a month during the course of treatment. The Act provides also that a person suspected of suffering from venereal disease may be arrested and detained for fourteen days, or longer if necessary, upon order of the Governor, for medical examination. All advertisements of cures for such disease, etc., are prohibited by the Act and heavy penalties are provided in case of publication in any newspaper of proceedings in court taken under the Act.

The report of the Departmental Committee recommends also that in case of the proposed marriage of an infected person, a communication by the medical practitioner shall be privileged, made to the person to be married or to the parent or guardian of that person, and that a marriage contracted by a person while in an infective state, without knowledge of the

other party, shall be ground for the decree of nullity of marriage. It is suggested that all still births, after the third month of pregnancy, shall be reported, that prisoners suffering from venereal disease shall be detained, and that extended powers shall be given to the police to repress solicitation. The introduction of a scheme of national insurance is regarded favourably by the Committee and it is suggested that in such a scheme sickness caused by venereal disease should be placed on equal terms with other illnesses.

Sir Alfred Keogh's recent article in the *British Journal of Surgery* gives one an idea of the tremendous task so successfully undertaken by the Royal Army Medical Corps upon the outbreak of the war. It may be said that the close connexion between medicine and war—one the natural antithesis of the other—and the extreme importance of the former during a period of war had never before been realized. Sir Alfred Keogh insists that the first great function of the medical service is the prevention of disease among the troops and the consequent maintenance of the strength of armies, but the greater part of the article is devoted to the second function of the service—the collection, removal, distribution, and care of the sick and wounded. The beginning of the war found the Royal Army Medical Corps prepared sufficiently to allow of its immediate expansion, coincident with mobilization. This meant that all the regular officers of the medical corps were required to devote themselves to administration and the care of the sick and wounded was placed in the charge of experts specially selected. The responsibility for the surgery of war was placed in the hands of consulting surgeons by whom all surgical developments are determined and the standard and scope of practical work and scientific investigation is set. They supervise the operation and upon them depends the efficiency of the surgical aid given to the British soldier. The importance of specialization and research has become more and more apparent and the tendency to classify the wounded into groups has grown steadily. Thus the

opportunities for research have been increased and the soldier has been accorded the benefit of expert advice and the best attention. "I am fully convinced," Sir Alfred Keogh says, "that the more the organization of hospitals into special departments is encouraged, the greater will be the degree of efficiency reached."

The success of the measures adopted, both in the prevention of disease and in the care of our sick and wounded, is a matter of general knowledge, but members of the profession nevertheless may well be proud of the praise won from those in a position to understand the difficulties that have been surmounted. In his report of the battle of Jutland on May 31st, Admiral Sir John Jellicoe said: "The work of the medical officers of the fleet, carried out very largely under the most difficult conditions, was entirely admirable and invaluable. Lacking in many cases all the essentials for performing critical operations, and with their staff seriously depleted by casualties, they worked untiringly and with the greatest success. To them we owe a deep debt of gratitude." Sir David Beatty, referring to the same engagement, said: "Exceptional skill was displayed by the medical officers of the fleet. They performed operations and tended the wounded under conditions of extreme difficulty. In some cases their staff was seriously depleted by casualties and the inevitable lack of such essentials as adequate light, hot water, etc., in ships damaged by shell fire, tried their skill, resource and physical endurance to the utmost."

Words of equal praise for the medical officers who took part in the battle of the Somme came from the Commander-in-Chief, Sir Douglas Haig, while the battle was still in progress, in the form of a Special Order of the Day issued to Deputy-Directors of Medical Services and by them read-dressed to all medical units with instructions that it be read on parade. The Order read: "The Commander-in-Chief directs me to convey to you and through you to the directors and all concerned under them, his high appreciation of the hard

work and the efficiency of arrangements for dealing with the medical aspect of the present situation."

A further tribute to the excellence of the medical service was paid by Lord Derby, shortly after his appointment as Under Secretary for War. Taking the medical service as an instance of the excellence of British organization, he said: "The battle of the Somme has emphatically demonstrated British organization to be markedly superior, in one very important respect, to that of the German forces. Our hospital arrangements have been superb. I do not believe the work of the Royal Army Medical Corps has been surpassed in any battle we have ever fought. Our soldiers are wounded one morning at the front in France; twenty-four hours later they are receiving expert medical attention in London hospitals. Such a feat has not often been paralleled; I think it may be taken as fair indication of the efficiency of the new British armies that wounded men may be rapidly transported along roads and railways carrying large quantities of munitions, food, and medical supplies towards the fighting lines. The new steel helmet, I might suggest, has completely vindicated its adoption. I have heard unofficially that minor casualties in our advance have been considerably reduced by this device; in fact, minor head wounds are now rare.

"Any advance like that now undertaken by the British army entails certain necessary casualties, but our losses have not been unduly large. It must be remembered that every soldier who passes through a dressing station, no matter how slight his wound or how quickly he returns to the front, figures as a casualty. A considerable percentage of our co-called losses have, therefore, been merely slightly wounded men. The method of the British advance is calculated to secure a permanent military advance for every serious casualty; we are not wasting men by sporadic tactics, but we are demanding the full price for every British life lost and for every foot of France we regain. Do not suppose that because our advance is slow it is not sure; it is because our advance is sure that it is slow."

Miscellany

Obituary

HARRY GOODSIR MacKID, M.D.

In the sudden death on August 17th of Dr. H. G. MacKid at his home in Calgary, the medical profession of Canada loses one of its best known and most esteemed members, and the city of Calgary a beloved physician and public spirited citizen. Dr. MacKid was born at Goderich, Ontario, in 1858, and after completing his medical studies in Edinburgh, Vienna and Berlin, started practice in Lucknow and Seaforth, Ontario. He later moved to Calgary, where for many years he was engaged in a large practice and was the most widely-known practitioner in Alberta. He was coroner, and also chief surgeon of the Canadian Pacific Railway, for that district.

By the members of the Canadian Medical Association and the readers of the Journal Dr. MacKid will be remembered as a former president and one of the most energetic and devoted members of the Association. He rarely missed a meeting, and always made his influence felt toward establishing a greater solidarity between the members of the profession throughout the Dominion. He had hosts of friends, who were attracted to him by his whole-souled, genial and kindly nature, not less than by his high professional qualities.

Dr. George Wilkins, of Montreal, died August 7th. He was born at Mountrath, Ireland, in 1842 and, at an early age, came to Canada with his parents. He was educated at the Toronto Grammar School and entered the University of Toronto as a student of medicine, obtaining his degree in 1866. The first four years after graduation were spent by Dr. Wilkins on one of the Allan steamers in the capacity of surgeon, after which he did some post-graduate work in London. In 1871 he was elected a member of the Royal College of Surgeons. He returned to Canada the same year and went into practice at Montreal. He became professor of pathology and, later, professor of practical physiology at the University of Bishop's College and, in 1882, professor of medical jurisprudence and lecturer in osteology in McGill University. In 1876

he was appointed physician to the Montreal General Hospital, a post he continued to occupy until the year 1900, when he was placed on the consulting staff of the hospital. From the time of his settlement in Montreal Dr. Wilkins was connected with the Sun Life Assurance Company as medical examiner and he it was who examined the first applicant in Montreal for an insurance policy in that company. From 1880 to the time of his death he was the medical director of the company and, in 1911, he became president of the Association of Medical Directors of Life Insurance. Dr. Wilkins was a member of the Montreal Medico-Chirurgical Society and was elected president in 1897; thus it fell to his lot to read the address of welcome to Lord Lister on the occasion of the visit of the members of the British Medical Association. His death came at the end of a long and successful career, marked throughout by the regard of his fellow practitioners and the affection of his patients.

Dr. John C. Mott, of St. John, New Brunswick, died July 26th, after a long and painful illness. He was born at Central Cambridge, Queen's County, New Brunswick, in 1839. After teaching some years, he entered upon the study of medicine at the University of Wooster, Cleveland, and upon graduation practised for a short time in Michigan. He afterwards returned to Canada and went into practice at Prince William, New Brunswick, where he continued his professional work for twenty-eight years. Six months were then spent in post-graduate work in New York, after which he settled in St. John, where he practised for over twenty years.

Dr. Charles W. Hewson, of Amherst, Nova Scotia, died August 3rd, after a long illness. He was born at Jolicure, New Brunswick, in 1844, was educated at the Mount Allison and St. Joseph's Colleges, and studied medicine under the late Dr. Nathan Tupper. He subsequently went to Philadelphia and, in 1872, graduated from the University of Pennsylvania. Returning to his native province he took up practice at River Hebert in the County of Cumberland, and in 1884 removed to Amherst. He retired a few years ago.

Dr. Edwin Henry Kertland, of Toronto, died August 1st, in the ninety-first year of his age. Born in Dublin, Ireland, he came to Canada as an engineer and surveyor and for some time was employed upon railway construction work. He subsequently

entered Queen's Medical College, Kingston, and obtained his degree. He served as physician during the Civil War in the United States.

Dr. J. A. Pidgeon, of Perce, died July 21st in the seventy-third year of his age. A graduate of the University of Bishop's College (1875), Dr. Pidgeon first practised in Montreal under the late Sir William Hingston. Upon the outbreak of an epidemic of smallpox among the North Shore Indians, Dr. Pidgeon was sent by the Government to take charge of the situation. Later he was appointed coroner for the Gaspe district, a position he held up to the time of his death.

Dr. Isaac Ralph Walker, of Ingersoll, Ontario, died at London, Ontario, on July 25th. He had been in practice at Ingersoll for fifty years. He graduated from the University of Michigan in 1862.

Dr. Ernest William McLaughlin, of Toronto, died suddenly on Saturday, July 29th. He had not been in active practice for some years.

Dr. Lee W. Burt, son of Mr. S. W. Burt, of Centreville, Ontario, died at Lancaster, California. Dr. Burt was born in 1883 and graduated from the University of California in 1905. He practised at Los Angeles and, for the past three years, at Lancaster.

News

MARITIME PROVINCES

Dr. N. E. McKay, of Halifax, has been elected president of the Provincial Medical Board in succession to Dr. Stewart, who is on active service. Dr. McKay and Dr. Moore, of Kentville, have been appointed to represent the Board on the Medical Council of Canada.

A new infectious diseases hospital is to be built at Halifax. It was suggested that the new hospital should be affiliated with

the Victoria General Hospital and should be built on the grounds of that hospital. This, however, was not found to be practicable as the Victoria General Hospital is a government institution for the treatment of non-infectious diseases.

ONTARIO

Dr. Hugh McKay, physician of the Ontario Reformatory at Guelph, has been appointed to the staff of the Convalescent Hospital for Returned Soldiers, Cobourg.

Dr. Deloss E. Bell, of Brockville, has been appointed physician to the Board of the Workmen's Compensation Act by the Provincial Government. Dr. Bell is a graduate of Queen's University.

A fine of fifty dollars and costs has been imposed upon Julius Wickels, of Waterloo, for practising medicine without a license.

A new reception building has been added to the Eastern Hospital for the Insane at Brockville and was formally opened on August 16th, when a special meeting of the Leeds and Granville Medical Association took place there under the presidency of Dr. J. C. Mitchell, superintendent of the Eastern Hospital. The Ontario Government was represented by Mr. S. A. Armstrong, assistant provincial secretary, and a large number of practitioners were present. An address was given by Dr. J. L. Chabot, of Ottawa.

Diphtheria is reported to be prevalent in London. The disease, from the newspaper reports, appears to be of a malignant type.

An outbreak of typhoid fever has occurred at Smith's Falls, where up to August 12th about sixty cases were reported. The outbreak has been probably caused by contamination of the drinking water.

Lieutenant-Colonel R. J. Gardiner, A.D.M.S., of the third military division, has been appointed medical officer of the Royal Military College, Kingston, in succession to Major R. K. Kilborne, retired.

BRITISH COLUMBIA

Two thousand, three hundred and seventy-four cases of sickness among the scattered population of the districts lying between Vancouver Island and the mainland were treated during the past year by the Columbia Coast Medical Mission. It is now twelve years since the Mission was started and the above figures are indicative of the splendid work that is being done. The mission ship, *Columbia II*, plys up and down the coast and at each point assistance is given to any who are sick and cases in need of hospital treatment are taken to Vancouver.

ARMY MEDICAL SERVICES

The Military Cross has been awarded to the following Canadian doctors:

Captain George Willard Treleaven, C.A.M.C., of Winnipeg, "for attending to the wounded under heavy shell fire and getting them to safety."

Captain Gordon Wiswell, R.A.M.C., of Halifax.

Captain Albert Ross, C.A.M.C. "After all his dugouts had been blown in he continued to dress and attend wounds in the open."

Captain Frederick James Tees, C.A.M.C., of Montreal, "for bravery and fearless devotion to duty while under heavy shell and machine gun fire. He led bearers to exposed positions with great gallantry, and successfully evacuated all wounded."

Captain Herbert William Wadge, C.A.M.C., of Winnipeg, who "under intense bombardment continued to dress wounds and evacuate the wounded. Four hours later, under conditions of extreme danger and difficulty, he succeeded in evacuating all wounded."

Lieutenant Willis C. Cornell, R.A.M.C., of Toronto, "for conspicuous gallantry and devotion to duty when collecting wounded under shell and gun fire."

Captain William Jonas MacAlister, C.A.M.C., "for attending wounded under very heavy fire. Though blown up and badly shaken by the explosion of a shell, he continued at his work, which at all times has been splendidly carried out."

Captain John Bruce MacGregor, C A.M.C. "Under great difficulties he carried out his duties and cleared all his casualties quite regardless of personal danger."

Captain Clarence Woods Johnston, C.A.M.C. "He went forward to establish a new dressing station under terrific fire, and worked continuously for three days with complete success in the evacuation of wounded."

THE Distinguished Conduct Medal has been awarded to Hon. Lieutenant-Quartermaster W. G. Ruswell, C.A.M.C., "for untiring work during many days, directing cars for the evacuation of wounded."

MILITARY MEDALS have been awarded to Lance-Corporal J. Cameron, C.A.M.C., Sergeant J. D. Nixon, C.A.M.C., and Private L. Saintonge, C.A.M.C.

THE Royal Red Cross, first class, has been awarded by His Majesty to Matron Eleanor Charleson. Nursing Sisters Janet Andrew and Ethel Holmes have been invested with the Royal Red Cross, second class.

DR. EDWARD S. HASELL, who since 1897 has been medical superintendent of the Provincial Royal Jubilee Hospital, Victoria, British Columbia, has been appointed chief medical superintendent of Military District No. 11. Dr. Hasell has also received from the Military Hospitals Commission the appointment of medical superintendent of the military hospitals for returned soldiers in British Columbia and the Yukon. He will be assisted by an advisory board composed of Dr. R. L. Fraser and Dr. O. M. Jones, and will be freed from all military responsibilities; the latter will be assumed by a hospital commandant.

THE following promotions in the Canadian Army Medical Corps have been announced:

To be Colonels: Lieutenant-Colonels J. T. Fotheringham, J. W. Bridges, H. S. Birkett, A. E. Ross, C.M.G.; C. A. Hodgetts, A. Mignault, Murray MacLaren, C.M.G.; G. S. Rennie, E. C. Ashton, G. LaF. Foster, Wallace A. Scott, Major G. E. Beauchamp.

To be Temporary Majors: Major J. A. Dickson (Militia); Major W. H. Merritt (Artillery); Captains R. M. Gorssline, J. S. Jenkins, E. C. Cole, A. W. McPherson, E. A. Robertson (Militia), A. F. Ross (Militia), T. G. Brodie (Militia).

To be Captains: Captains H. G. Young, W. J. McLean, and R. F. Pennefather (from Militia).

To be Temporary Captains: Captain W. G. Fraser (Militia), E. T. Curran, T. Coleman, W. F. Coy, J. G. MacNeill, W. H. MacMillan (Army Service Corps), J. H. Slayter, M. G. Brown, C. L. Blight, W. G. Blair, A. E. Blackett, R. A. Dowd, J. S. Fitzsimmons, E. R. Graham, S. E. Holmes, N. MacL. Harris, F. D. Sinclair, E. Gardner, B. C. Reynolds, L. R. Shier, C. C. Schlichter, Sergeant-Major H. B. Van Wyck, Lieutenants J. J. Thompson, M.B., A. J. Lomas, M.B., and R. P. Borden (Militia).

To be Temporary Lieutenant: G. E. Charters.

Dr. F. Hamilton Mewburn, of Calgary, has been appointed chief surgeon of the Duchess of Connaught Canadian Red Cross Hospital at Cliveden.

Dr. J. G Sutherland, of St. Catharines, Ontario, has left for England to join the staff of a military hospital there.

Captain H. C. P. Hazlewood, of Toronto, has been appointed medical officer of the 204th Beaver Battalion.

The following have joined the R.A.M.C.: Dr. Philip Nase, of St. John, New Brunswick; Dr. J. W. B. Hanington, of Victoria, British Columbia; Dr. W. J. Weaver, of Fredericton, New Brunswick.

Dr. Herbert White, of McBain, Michigan, has joined the Canadian Army Medical Corps.

CASUALTIES

Killed in Action

Lieutenant W. L. Evans, R.A.M.C., was the son of Mr. W. L. Evans, of St. Mary's, Ontario. He was twenty-five years of age and was a graduate of the Medical Council of Canada. He passed the examinations held at Winnipeg in June, 1915, and at once joined the Royal Army Medical Corps. He was killed in action on August 11th, 1916.

Died of Wounds

Captain James Parnell Walsh, C.A.M.C., of Quebec. Captain Walsh was in the thirty-fifth year of his age and was

born at Quebec. He graduated from McGill University in 1908 and went into practice at Quebec, where he served on the staff of the Jeffrey Hale Hospital. In February, 1915, he went overseas to join the staff of No. 2 Canadian General Hospital at Le Tréport. He remained with that unit for five months, when he was transferred to a combatant unit under the command of Lieutenant-Colonel Swift, of Quebec. Captain Walsh distinguished himself by his bravery and devotion to duty and on May 6th, last, was mentioned in despatches for gallantly rescuing several wounded soldiers under heavy fire. His death occurred in London, the result of shrapnel wounds received in France. His marriage was to have taken place very shortly.

Died on Service

Lieutenant-Colonel George M. Giles, C.A.M.C., of Kingston, Ontario, died at Plymouth, England, on August 30th, in the sixty-fourth year of his age. Lieutenant-Colonel Giles was attached to the staff of the Duchess of Connaught Red Cross Hospital but was obliged to resign his commission last March on account of ill-health. He had served with the Royal Army Medical Corps in India, and in South Africa throughout the Zulu war of 1878.

Captain Thomas G. Brodie, C.A.M.C.

Seriously Ill

Captain Harold G. Gillissie, of Miami, Florida.

Captain J. Romeo Gauthier, C.A.M.C., of Montreal. Captain Gauthier has since recovered and according to the latest report, has been discharged.

Nursing Sister Anna L. Bruce, of Stephenfield, Manitoba.

Wounded

Captain Douglas St. Clair Creighton, C.A.M.C., of Saskatoon. This is the second time Captain Creighton has been wounded.

Captain Richard Coatsworth, R.A.M.C., of Toronto.

Captain A. F. Menzies, R.A.M.C.

Retrospect of Literature

Retrospect of Wound Infections and Their Treatment as Advocated by Colonel Sir Almroth E. Wright, C.B., M.D., F.R.S., Embodying the Results of Work at the Research Laboratory, Attached to No. 13 General Hospital, Boulogne-sur-Mer.

Wright divides his subjects as follows:

1. Nature of wounds.
2. Nature of the infection.
3. Response of the man to his infection.
4. Treatment.

1. Nature of the Wound

(*a*) *Rifle wounds traversing only soft parts.* The bullet in passing through cuts the walls of blood vessels so that hæmorrhage results which soon coagulates, filling the tract with clot. In this type of wound we have a light microbic implantation, only small numbers of microbes having been left behind by the missile on its passsage through the soft tissues; the walls of the tract will have been flushed by the out-flowing blood, and the microbes left are enveloped in clot and will thus have the full bactericidal power of the volume of blood which fills the wound brought to bear upon them. Thus we have the most favourable conditions for healing.

(*b*) *Rifle wounds where the bullet comminutes bone.* Where a projectile comes up against bone it will shatter it and make a large exit wound by blowing out the fragments and splinters; at the same time scattering the charge of microbes far and wide through the tissues, which otherwise would have been sown only on the walls of the tract. Thus we have very unfavourable conditions. Not only is the circulation of the wound disorganized, but it contains bone and soft tissues cut off from their blood supply and bound to necrose and slough. And deep in the tissues we have an

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Abstracted by W. A. Lincoln, M.D., F.R.C.S., Calgary, from addresses delivered before The Royal Society of Medicine of London, October 8th and 14th, 1915.

Read before the Calgary Medical Society, April 4th, 1916.

implantation of microbes which no outflowing blood will wash away. And even more important, the outflow of lymph from the wound surface is arrested by the desiccation of the external wound surface so that if left to itself it becomes lymph bound.

(*c*) *Seiere shrapnel, shell and bomb wounds.*—The essential feature of this class of wound is that we have blunt or flat missiles and that in consequence, as compared with bullet wounds, we have less penetration and perforation and proportionally more bruising, and at the same time larger portions of infected skin and clothing are carried in by the missile so that we have very bad physiological conditions with a heavier microbic implantation.

(*d*) *Slighter punched-in wounds produced by shrapnel, shell and bombs.* These are comparatively superficial wounds with steep sides going down to a floor sunk below the level of the surrounding skin. The important thing here in regard to the microbic infection is that it is made not into an open tract from the walls of which the microbes might be washed off by the outflowing blood, nor yet into effused blood which is up to a point a very uncongenial culture media for microbes; but into lymph standing in lymph spaces. Now the lymph in such spaces is under very low pressure and consequently when broken into we have nothing resembling the out-flow of blood from a wounded vein or artery. There will be at most a little weeping of lymph which soon dries, forming an impermeable coating. Thus we have very unfavourable conditions. The antibactericidal power of the lymph is soon exhausted and because of arrest or outflow there will be no renewal of the lymph. Thus in a few days we get all around our punched-in wound a hard, infiltrated edge margined toward the healthy skin by zones of pale pink and in the infiltrated walls of the wound there confronts us an imprisoned infection. That infection will soon extend, and, if its way outward to the surface is too solidly obstructed, it will spread inward; giving rise according to circumstances and the nature of the microbic infection to cellulitis or gas gangrene. In ordinary course, however, the infection will break through to the surface and then we have an infection of flowing discharges.

2. Nature of the Microbic Infection Met at the Front

Wright divides these into two main classes:

(*a*) What he calls Scrophytes, which, presumably because they find ready-made pabulum in the blood fluids, can live and multiply in serum.

(*b*) Another class called Sero-saprophytes, which, so far as we know, can develop in the blood fluids only when they have lost their antitryptic power, the power in question being that which inhibits the digestive process which would be capable of converting the native albumens of the serum into pabulum for microbes. Intermediate in character between these two classes is a class of microbes which cannot grow in the serum when there is only a small implantation but which, no doubt owing to the fact that they bring into operation powerful digestive ferments, succeed in establishing themselves when we make a heavy implantation. We may call these imperfect or secondary serophytes. To the category of serophytes belong the streptococcus and the staphylococcus, the latter being far inferior to the former in its power of multiplying in unaltered serum. To the category of imperfect serophytes belong the bacillus ærogenes capsulatus, the bacillus proteus, the bacillus pyocyaneus, and the wisp-shaped diphtheroid bacillus commonly found in foul suppurating wounds. To the class of sero-saprophytes belong the large number of microbes found in such wounds. The microbe most universally present is the streptococcus. It differs in many respects from the classical streptococcus pyogenes. In film and culture preparations it shows up nearly always as a diplococcus; it is somewhat lance-shape and bent at an angle in the form of saddle-bags. Its most remarkable characteristic is the freedom with which it grows out in normal blood serum, and also upon agar when transplanted into blood. It has also been demonstrated that it is of fæcal origin. The staphylococcus by reason of its wide distribution in the skin and its serophytic properties is found to be present in practically all wounds, but its growth is very quickly restricted by changes produced in the immunizing responses of the patient. The bacillus ærogenes capsulatus, which is also, of course, a constant inhabitant of the fæces, is implanted, one may take it, into every wound. The microbe, it is noted, is only an imperfect serophyte and consequently the blood has a very considerable bactericidal power for it so that if the blood fluids and leucocytes are brought freely to bear upon it we have very little to fear from its effect.

3. Response of the Wounded Man to His Infection

It must be kept in mind that in wound infections, as everywhere, where bacterial toxines are elaborated and absorbed into the blood, the machinery of the immunization is after a time called

into play, and as a result the blood is put into a better condition for defence. And then begins a serious conflict between the invaded individual and the invading microbes. The wounded man is reacting to his infection with a systemic immunizing response and the changes so induced in the blood exert a decisive influence on the course of the infection, while the surgeon who is dressing the wound and making local applications is only in a subordinate way helping, or as the case may be, hindering the curative procedures of nature. Let us consider how the blood combats the infection. (*a*) Data furnished by measuring the antitryptic power of the patient's serum. The antitryptic power of the serum acts as a check upon all microbic growth. In the case of the serosaphrophytes it completely balks their effort to establish themselves in the serum. In the case of the imperfect serophytes, it places a very formidable obstacle in the way of growth. In the case of serophytes proper, it determines whether the growth shall be scanty or luxuriant. It has been found that the antitryptic power of the serum of wounded men rises in many cases from four to five times that of normal. It has also been found that the antitryptic power of the serum rises after inoculation with vaccine. This may explain the observation that vaccine given for a specific disease often seems to exert a beneficial effect upon other diseases. (*b*) Data furnished by pyo-sero-culture. This is a method by which pus is drawn up into a pipette and blown out, leaving a certain amount adherent to the sides. Then a series of ten small portions of the patient's blood is drawn up, each being separated by a bubble of air. By this method the first culture which traverses the whole length of the pipette receives a heavy implantation from the pus adherent to the sides, and each culture below this a decreasing implantation. This is incubated and each culture plated and the number of resulting cultures studied and compared with normal serum. This will give a fairly accurate idea of the ability of the patient's blood to cope with the infection. Another method is that known as pyo-culture, by which the pus is taken and incubated and examined before and after to see if the microbes have increased or remained stationary in number. If so, it may mean a fault in the immunizing response on the part of the patient, or as a consequence of the surgeon having suffered the wound discharges to accumulate and become corrupt in the wound. If not, it clearly suggests that the patient is making a good immunizing response and that the wound with proper attention will progress favourably. (*c*) Data furnished by measurement of the opsonic index. The changes in the serum

which gradually render it a more and more uncongenial culture media for microbic growth have their counterpart in changes in the serum which render the microbes an easier prey for phagocytes. These changes in the opsonic power of the serum are exactly similar to those which manifest themselves in all other forms of localized infection. (*d*) Data furnished by a study of the emigration response of the patient's leucocytes. It is shown that in patients who have made immunizing response to their wound infections or to the inoculation of streptococcus vaccines, an emigration response to streptococcus implantation is observed which is strikingly greater than than of the normal man. Work on this phenomenon is not as yet complete. (*e*) Data furnished by the study of the bactericidal power of the whole blood. This is estimated by making mural implantations of pus into a culture of the patient's blood, and by varying the form of this the following conclusions are drawn: When the leucocytes are in the front rank and the blood fluids behind, the elements of the blood are marshalled in the order which is most favourable for combating streptococcic infections. This is called the agathotropic arrangement. The unfavourable arrangement is when the blood fluids are in front and the leucocytes behind. This is kakotrophic arrangement.

4. Treatment of Microbic Infection of Wounds.

The subject is treated under four headings:

(*a*) *Treatment by antiseptics.* The efficiency of an antiseptic depends upon its bactericidal power in albuminous fluids and upon its penetrating quality. It is well known that the ordinary antiseptics form chemical combinations with all native albumens and not specifically with those which compose bacterial protoplasm. It is also noted that it is found practically impossible when employing as material pus from foul suppurating wounds to sterilize it by adding any of the ordinary antiseptics. Experiments are conducted to show that the ordinary antiseptics are incapable of penetrating through anything but the thinnest film of pus or blood and are therefore of very slight utility in an infected wound. The statement is made by Wright and his fellow workers that they have not come across any satisfactory clinical or bacteriological evidence of the utility of antiseptics as employed in infected wounds; and moreover they may and often do have an injurious effect. Disastrous results often supervene when antiseptics made up in viscid or semi-viscid excipients are introduced into the wound.

This confines the discharges and arrests the out-flow of lymph, thus imprisoning the infection. With perhaps the exception of carbolic acid employed in concentrated form all antiseptics in their degree, and strong antiseptics in particular, would seem by coagulating the albuminous substances on the surface of the wound to exert this prejudicial effect. The usual procedure for the sterilization of the skin in the field ambulance is to paint strong iodine all around the wound and then to cover in the wound with cyanide gauze. This in many cases is followed by results like those which used to be obtained when carbolic fomentations were used as a prelude to surgical operations. There is produced, and this applies to every application which irritates the skin, first, reddening of the epidermis, then effusion and blistering, and then there develops in the blisters a luxuriant growth of serophytic microbes; in other words, by our misdirected energy we cultivate at the very doors of our wound, upon the very area of the skin which we intended to keep free from microbes, a rich harvest of streptococci and staphylococci. The general conclusion is that clinical observation as well as laboratory findings demonstrate the inefficiency of antiseptics, and also suggests that such form of treatment may sometimes be not only useless but harmful.

Antiseptics which are specifically bacteriotropic. Such drugs are salvarsan and optochin. Experiments are being tried and it has been shown that the streptococcus is killed in serum by these drugs but a report on their effects is not yet ready.

(*b*) *Treatment by surgical procedure.* These are treated under: (1) Opening up of the wound and incision of the tissues undertaken to get drainage for imprisoned infections; (2) washing out of the wound and the irrigation of the walls with therapeutic fluids; (3) the immobilization of the part for the avoidance of auto-inoculation; (4) ablation of the heavily infected and infiltrated walls and floor of the wound; (5) secondary suture of the wound for restricting the area of the exposed and infected surface and closing the wound when the infection has been overcome. This last form is used in conjunction with the treatment by phylacagogic methods. The right time to perform it is determined by making a series of impression preparations of the wound and thus determining the relative preponderance of germs and leucocytes, it being carried out when very few microbes and a profusion of leucocytes are present.

(*c*) *Treatment by phylacagogic methods.* Physiological stimuli are applied to wounds not only incidentally in antiseptic treat-

ment, but also of set purpose as therapeutic agents. Dry or moist heat, ether introduced into the wound, stimulating ointments or lotions, exposure of the wound to sunlight, air or radium and electricity, as well as the method of Bier are all methods of treatment which are capable of bringing the blood fluids and leucocytes into application in the wound. We ought therefore to give up employing these agents as fetishes and preclude their use by a careful study of their physiological action. It has been found that the best drug to bring the blood fluids or leucocytes into the wound is a solution of sodium chloride. When used as a *hypertonic* solution in strengths of 5 per cent. to 10 per cent., with ½ per cent. sodium citrate, it acts as a lymphagoge; when used as a *hypotonic* solution in strengths of ·85 per cent., it acts as a leucocytatoge. *Hypertonic* salt solutions act in three ways: (1) Physical. By the process of diffusion the salt is carried into all the recesses of the wound and then to a lesser extent on into the tissues and the serum of the blood is brought out from the tissues through the wound, but in order to maintain this action the salt solution must be renewed or it soon loses its hypertonic quality and then its action ceases. (2) Physiological action of the hypertonic solution. When a solution of 5 per cent. or over is brought into direct contact with pus or blood the leucocytes are broken down and trypsin is set free. In other words, strong salt solutions acting on a medium containing leucocytes will promote auto-digestion and provide a nutrient substratum which will, as soon as the salt is removed, favour the growth of microbes. In the tissues around the wound the leucocytes are driven back by negative chemotaxis by the hypertonic solution and we have produced a kakotropic arrangement. (3) Effect on the condition of the wound and the microbic infection. Two per cent. solutions will begin to inhibit and 5 per cent. solutions will completely arrest the growth of pyogenic microbes. The effect upon the wound is marked. In the case of a sloughing or indurated condition, coming into effect upon the leucocytes these are broken up and trypsin set free, thus favouring auto-digestion. Coming into operation at the same time upon the walls of the wound it will promote the out-flow of lymph. The effects of this will be to loosen and separate the slough and disperse the induration, and finally to give us, provided the concentration of the salt solution is kept up, a wound in which the muscles and connective tissues lie before us as bare and clean and as free from pus as meat exposed on a slab at the butcher's. Moreover, impression preparations will show that the surface lymph is practically free from leu-

cocytes and that the sero-saphrophytes have disappeared, leaving behind only a few streptococci and staphylococci. It has been noted that we have the elements of the lymph in the kakotropic arrangement with the lymph spaces opened up and the leucocytes behind, which is not the most favourable arrangement for combating an infection so that we must take a step in advance and bring our leucocytes into action. This is done by applying a hypotonic or physiological saline solution. This brings the leucocytes to the surface and in a few hours the wound becomes covered with a fine grey film. We now have the elements of the lymph in the agathotropic arrangement and a film preparation shows abundance of leucocytes with few or no microbes and we are ready to proceed with secondary suture of our wound to be repeated if necessary until entirely closed. A number of demonstrations and illustrations are shown to demonstrate the mothods of using bandages and tubing to bring the solutions into direct contact with all forms of wounds and to maintain a constant flow to keep up the strength of the solution.

(*d*) *Treatment by vaccines.* Treatment by vaccines has hardly any meaning in connexion with antiseptic treatment; but it is, as a moment's consideration will make plain, very intimately linked up with phylacagogic treatment. For once we have made up our minds that all infection will have to be fought by the protective powers of the individual it will be reasonable to look around and see whether the protective powers generally cannot be reinforced. It will also occur to the mind that not only the blood fluids could be reinforced in protective substances, but also chemotactic sensibility of the leutocyces could be altered so as to give a more vigorous emigration response. In employing vaccines we ought to select those bacteria which are least easily killed by the protective elements of the blood. That will mean that we ought to put into our vaccine principally the streptococcus and the staphylococcus, for these belong to the class of serophytes, and then also the bacillus ærogenes capsulatus, which is an imperfect serophyte. Wright has had a vaccine of this nature prepared and advises that a prophylactic injection of this be given to every wounded man at the regimental first aid post. He also advises further injections whenever at a latter stage the streptococcus or the bacillus ærogenes capsulatus establishes a footing in the wound and begins to spread as manifested in the early stages of erysipelas, cellulitis or gas gangrene. Another favourable time is when secondary suture is carried out. Linking up the whole line

of treatment, Wright suggests that at the regimental first aid depot the bleeding be arrested, the wound bandaged and a prophylactic dose of vaccine be given and that at the field ambulance a prophylactic dose of antitetanus serum be given, evident foreign bodies and bruised tissues be cut away and efficient drainage established. All wounds unless showing evidence of primary union, to be treated with hypertonic salt solution. At the casualty clearing station more extensive operations can be carried out for the purpose of obtaining good drainage and for the removal of the projectile and extraneous substances as well as for the resection of hopelessly infected tissue. At the base hospital two classes of cases call for operative procedures. First there will be the case of spreading infection in the tissue, cellulitis and gangrene, which have manifested themselves during transit. These require free incision and application of saline solutions. Further there will be operations postponed from the casualty clearing station because of the stress of work or for the patient's sake, to give him the benefit of special equipment or special skill available at the base. Because of the longer hospital stay the full phylacagogic treatment can be embarked upon as previously described. There is considerable evidence to show that when this form of treatment is carried out the virulence of the infection can be reduced and the death rate and length of stay in the hospital materially reduced.

Medical Societies

COUNCIL OF PHYSICIANS AND SURGEONS OF NEW BRUNSWICK

The semi-annual meeting of the Council of Physicians and Surgeons of New Brunswick was held in St. John on July 18th, 1916. The following were present: Dr. S. C. Murray, Albert, president; Dr. J. D. Lawson, St. Stephen; Dr. G. C. Van Wart, Fredericton; Drs. Thomas Walker, A. F. Emery, W. W. White, of St. John, and Dr. Stewart Skinner, St. John, registrar.

Business mostly of a routine nature was transacted. Dr. W. W. White and Dr. G. C. Van Wart were elected the representatives on the Medical Council of Canada for the coming four years.

A readjustment of the examiners for the Council for the year

was made. The next professional examination will be held at St. John commencing on the fourth Wednesday in January, 1917. The following graduates in Medicine have passed the January examinations: Dr. S. H. Calnek; Dr. L. de V. Chipman; Dr. P. P. Balcom; Dr. E. T. Kennedy.

The Medical Register contains 242 names.

The Council considered the question of requiring all candidates for registration to pass the examinations of the Medical Council of Canada. No definite action was taken.

NEW BRUNSWICK MEDICAL SOCIETY

The thirty-sixth annual meeting of the New Brunswick Medical Society opened in St. John July 18th and closed July 19th, 1916, the president, W. W. White, M.D., in the chair.

After the reading of the minutes, Dr. White addressed the meeting, and urged the members by coöperation to increase the membership of the Society and dwelt on the necessity of congregating to discuss and review the advancement of medical science, that being the strongest incentive to stimulate the practitioners of the province to keep abreast of the times in their work. He also made references to the value of good hospital facilities to a community and to the lamentable state of the General Public Hospital in St. John, expressing the hope that he would see the day when that city would possess a hospital worthy of the name.

Commissioner McLellan on behalf of the Mayor, who was absent from the city, welcomed the visitors and assured the members that the civic government was awake to the need of improved hospital facilities and was prepared to do all in its power to further such interests.

The business of the Society was transacted and the following officers elected for 1916-1917:

President, S. C Murray, M.D., Albert; 1st vice-president, G. G. Corbett, M.D., St. John; 2nd vice-president, F. H. Wetmore, M.D., Hampton; treasurer, W. E. Gray, M.D., Milltown; recording secretary, F. J. Hogan, M.D., St. John; corresponding secretary, A. E. Macauley, M.D., St. John; trustees: D. R. Moore, M.D., Stanley; J B. Gilchrist, M.D., Norton; L. M. Curren, M.D., St. John.

The papers contributed were: "Syphilis," by Mayes Case, M.D.; "Medical inspection of schools," by G.R.J. Crawford, M.D.; "Cholecystitis," by A. F. Emery, M.D.; "Wound infection," by

T. D. Walker, M.D.; "Otitis media," by F. H. Neve, M.D.; "Earlier diagnosis of tuberculosis," by H. A. Farris, M.D.; 'Diagnosis and treatment, cerebro-spinal meningitis," by J. M. Barry, M.D.; "Diabetes," by F. H. Wetmore, M.D.; "Acute empyæma," by C. M. Kelly, M.D.; "Mental deficiency in children," by G. G. Melvin, M D.; "Presentation of cases," by W. N. Miner, M.D.

The Registrar's report of the Council of Physicians and Surgeons o New Brunswick was read and passed.

The question of abandoning provincial examinations for registration for the province, in which case applicants would be required to pass the Board of Examiners of the Medical Council of Canada before being qualified to practise in New Brunswick, is under the consideration of the Council. It was moved and passed that the New Brunswick Medical Society is heartily in accord with such movement.

It was moved and passed that the Provincial Government be not fied that the Secretary of the Provincial Board of Health is not qualified, and that steps be taken to compel him to qualify in order to hold the position.

St. John was decided upon as the place of next meeting to be held the third Tuesday of July, 1917.

ASSOCIATION OF MEDICAL HEALTH OFFICERS OF NOVA SCOTIA

The annual meeting of the Association of Medical Health Officers of Nova Scotia took place at New Glasgow on July 4th. The attendance was good and keen interest was manifested in the papers presented. Among those who were present were Dr. A. P. Reid, formerly provincial health officer, and Dr. J. B. Black, ex-M.P. As a mark of appreciation of the services rendered by them in the cause of public health, Drs. Reid and Black were made honorary members of the Association.

The chair was taken by Dr. John K. MacLeod, president. In the course of his remarks, Dr. MacLeod drew the attention of the members present to the lack of permanency in office of the medical health officer in many districts and the refusal of some of the municipal councils to pay the expenses incurred by the medical health officer in attending the annual meeting of the Association. This, he said, did not encourage the officers of health to give their best attention to the work of their office or to come to

the annual meetings. A committee was appointed to approach the Provincial Government with the request that the Public Health Act be amended so as to ensure more permanency to the position of medical health officer, by requiring that no medical health officer be removed from office without the sanction of the Governor-in-Council, and that the expenses of members attending the annual meetings of the Association be defrayed by the respective city or municipal councils.

Appreciation was expressed of the loyalty of the members of the Association who are on service overseas, namely, Drs. L. P. Churchill, of Shelburne; R. C. McLeod, of North Sydney; O. G. Donovan, of New Germany; L. D. Densmore, of Sherbrooke; A. C. Jost, of Guysboro; J. F. Ellis, of Sherbrooke; J. S. MacKay, of Windsor; C. H. Morris, of Windsor; C. B. Trites, of Liverpool; and Smith L. Walker, of Truro. On Home Service, full time: Drs. V. F. Connor, of Hantsport, and F. O'Neil, of Louisburg.

The first paper read was entitled "Retrospective and Prospective" by Dr. W. H. Hattie, provincial health officer. Although the death rate last year was greater than the year before, the number of deaths from communicable diseases was considerably less. The death rate from tuberculosis has been growing less for the past five years and last year was 34 per cent. less than in 1910. In discussing this paper, Dr. Moore said that notification of cases of infectious disease had been neglected both by the profession and the public. There was also carelessness in notifying teachers of the presence of infectious disease among pupils. Dr. DeWitt thought that the high death rate from tuberculosis in the province was to be explained by climatic conditions rather than home conditions, as he did not think there was any difference in the latter respect between the province of Nova Scotia and other countries where the mortality rate was more favourable.

Dr. A. P. Reid gave a paper on "Sanitation as it was". The paper, which was largely reminiscent, contained an interesting description of the sanitary customs of Indian tribes during the early days of his professional career. He thought that the ultimate solution of the tuberculosis problem was to be found in the conversion of every home into a virtual sanatorium. Dr. Dunbar was unable to agree with Dr. Reid upon this point and thought that such a plan would be very difficult to carry out. Dr. Armstrong felt that especial reference should be made to the pioneer work done by Dr. Reid on behalf of public health in Nova Scotia. He had blazed the first trail. Such organizations as were in existence as well as the present legislation were due largely to him.

"Some reference to the practice of medicine then and now," was the title of a paper given by Dr. DeWitt. In discussing this paper, Dr. W. A. McLeod referred to the pioneer work of the late Dr. J. F. McDonald, of Hopewell, in the anti-tuberculosis campaign. Dr. S. N. Miller said that he had been able to keep patients comfortable under canvas all through the winter, with distinct benefit to them.

Dr. W. B. Moore gave a paper entitled, "Further remarks upon the public health value of closer inspection of the individual by the trained observer." Dr. Hattie referred to the work of the Life Extension Institute and the manner in which certain life insurance companies encourage their policy holders to submit to periodic medical examinations. Such examinations were particularly desirable in view of the fact that though the average length of life had been considerably increased, in certain communities in the United States the death rate in those who had passed the age of forty was becoming heavier, due, apparently, to the increasing prevalence of diseases of a degenerative type which are fairly responsive to treatment if detected early enough.

"Cerebro-spinal fever from the standpoint of epidemiology" was the subject chosen by Dr. Nicholls, director of the public health laboratory. Unfortunately Dr. Nicholls was ill and unable to be present. In his absence the paper was read by the Secretary. The distribution of the disease in the province was discussed, the majority of the cases occurring in the cities and towns. The difficulty of the epidemiological study of the disease was increased by the presence of the meningococcus without the production of specific lesions and the association of that organism with conditions which were not meningeal, the irregular distribution of the disease, the rarity of its occurrence in epidemic form and its not infrequent appearance in disguised forms. Special importance was to be attached to the carrier, about 2 per cent. of apparently healthy individuals having been found to harbour the meningococcus under ordinary conditions. Analogy was traced between pneumonia and cerebro-spinal fever—both exhibit the same seasonal variations and attack the young and vigorous; both, while usually non-epidemic, may occasion epidemics. The proportion of people attacked by cerebro-spinal fever is smaller but the mortality is greater. The paper was discussed at some length. Dr. C. Miller said that although his practice was in a mining district he had not found that the disease was more common there than in other places, although some writers contended that this was so. Dr.

Cameron said that several of his cases had followed pneumonia or tubercular pleurisy and he thought it possible that an association existed between the disease and these preëxisting conditions. Dr. Hattie stated that recovery was to be expected only in cases of the epidemic form of the disease, that is those due to the meningococcus of Weichselbaum. The result would appear to be fatal in in all cases caused by the tubercle bacillus and the pneumococcus.

A paper entitled "Disinfection" was read by Dr. John K. McLeod. He stated that for many years he had carried out a much less stringent quarantine than was formerly considered necessary, with satisfactory results. The aim should be to prevent the escape of infective discharges by attending to their immediate destruction. This would render terminal fumigation unnecessary. He would advise the following measures: isolation of the patient, disinfection of discharges and of clothing which may have been soiled thereby, scrupulous asepsis on the part of attendants, daily cleansing of the patient's room, and a terminal house cleaning. The paper led to an interesting discussion, at the conclusion of which a committee was appointed to assist the Provincial Health Officer in revising the rules for quarantine and disinfection.

Dr. J. B. Black then gave a paper on "A Federal bureau of public health". He referred to the present anomalous situation—large sums of money are devoted to measures designed to improve the health of farm animals but no similar provision is made to conserve the health of the people. Considerable work is done through the quarantine service and the inspection of food but it lacks coördination and there is no proper medium for dealing with matters of interprovincial or international concern. Canada has no national laboratory and is dependent upon the laboratories of other countries for the information which can be acquired only through research. Dr. Cameron said that all were grateful to Dr. Black for the efforts he had made on behalf of a Federal health bureau while he was a member of the Dominion Parliament. Why should our government be more solicitous of the health of the lower animals than of its citizens? National pride, if nothing else, should lead to the establishment of such a bureau. Mr. John H. Sinclair, M.P., upon invitation of the president, continued the discussion. He had been struck, during the evening's proceedings, by the fact that the medical profession lacked a court of appeal to which important matters might be referred for decision. He had heard Dr. Black urge Parliament to establish a Federal bureau of health and had wondered why the measures he advised had not

met with greater support particularly from members of the medical profession.

The officers elected for the year 1916-17 were: president, Dr. Geo. E. DeWitt, of Wolfville; first vice-president, Dr. J. J. Cameron, of Antigonish; second vice-president, Dr. W. B. Moore, of Kentville; secretary, Dr. W. H. Hattie, of Halifax. Councillors: Drs. S. A. Fulton, of Truro; C. W. Bliss, of Amherst, and D. Francis, of Sydney Mines.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The twelfth regular meeting of the Society was held Friday evening March 17th, 1916, Dr. F. A. L. Lockhart, president, in the Chair.

Living Case: Double Facial Paralysis, by Dr. G. S. Mundie.

(A report of this case will be found on page 429 of the May number of the Journal.)

Discussion: Dr. M. Lauterman: I would like to ask if Dr. Mundie uses the luetin test at all in his cases. I am fully in accord with the absolute uselessness of the Wassermann in a case of this description but in my work I have had some satisfaction in the spinal fluid leucocyte count and especially so from the use of luetin as suggested by Noguchi.

Dr. S. G. Mundie: We considered the question of neuritis, but with the pupils showing the Argyll-Robertson condition we thought it more along the lines of a luetic history and also we thought of it as a definite general paresis case. We took the trouble to verify that he had lost all his money in ten years, but I considered the consequent anxiety and worry over the loss and the energy expended in taking up other branches of business, together with failure in them, might be a point in favour of our diagnosis of general paresis. Although the face was absolutely paralyzed on the left side there was no loss to Faradic current, which I think is a point against peripheral neuritis. With regard to Dr. Lauterman's remarks we do not use the luetin test in the out-patient department of the hospital, we have used it in the wards where it has proved very satisfactory. Later we hope to get our patient into the wards and do the different tests on the cerebro-spinal fluid.

Pathological Specimen: Hypernephroma or Grawitz tumour of the kidney, by Dr. M. Lauterman.

The mass was removed from a man sixty years of age who gave a history of having to get up at night to urinate for the last two years, at first occasionally, later regularly from four to six times. About six months ago hæmaturia first made its appearance with occasional recurrences, but for the last two months fairly constant, varying only in quantity, being more marked towards night and less marked on rising in the morning, thus showing the influence of rest. There was loss of weight, constipation, slight anæmia and anorexia but these were the only other symptoms present and there was absolutely no pain or other discomfort.

Examination at this time revealed no evidence of tumour and the freshly voided urine, apart from the presence of occult blood, was apparently normal. The prostate on palpation was somewhat tender, smooth, elastic and uniformly enlarged to about twice its normal size, the median cleft being well marked. The passage of a No. 14 French soft rubber Wishart catheter met with no resistance until the neck of the bladder was reached; here gentle continued pressure was necessary to overcome a resistance which was rather more than normal; bloody urine began to flow freely when the catheter was eleven inches from the meatus, showing some lengthening of the urethra. The bladder was now washed out with warm boracic acid solution, about six ounces being left in for cystoscopic examination. A size 24 French Braun-Buerger examining cystoscope was now introduced, slight obstruction being encountered at the vesical neck. This was afterwards seen to be due to a well marked prostatic bar which extended from side to side between the lateral lobes of the uniformly enlarged prostate. Just beyond this obstruction to the left was seen a dilated vein with superficial excoriation from which free bleeding was taking place. The ureteral openings appeared normal but during the few seconds that elapsed before the distending medium became cloudy no urine was seen coming from them; this was probably due to a reflex arrest of renal secretion incidental to the introduction of the cystoscope. This examination, revealing as it did a bleeding point within the bladder, prostatic hypertrophy, and a prostatic bar, seemed sufficient to account for all the symptoms. Believing as I do, however, that it is a good principle to examine the kidneys in these cases, with a view to determining their relative efficiency, I accordingly catheterized both ureters and found that the left kidney was secreting bloody urine and that its efficiency was relatively as 35 is to 100, i.e., the right kidney was eliminating 65 per cent. more nitrogenous matter than was the left. I now injected a solution of ar-

gentite, as prepared by Parke Davis and Company according to the formula of Dr. Young of Boston and Mr. Godsoe of the Massachusetts General Hospital, for the purpose of having a pyelographic plate made. Unfortunately this did not prove to be a success so that the only thing I had to go by was the one-sided hæmaturia and the impaired functional activity of that kidney. In spite of the absence of other symptoms I felt satisfied that I was dealing with a hypernephroma and decided to explore the kidney and if necessary do a nephrectomy. This was done at the Western Hospital under gas-oxygen anæsthesia, administered by Dr. W. Bourne and assisted by Dr. F. R. England. I exposed the left kidney through an oblique incision and the diagnosis of hypernephroma was at once confirmed. A total nephrectomy was done. On account of its large size and dense adhesions considerable difficulty was experienced in delivering the tumour, but thanks to Dr. England's assistance its removal was accomplished with scarcely any hæmorrhage, the patient losing less than an ounce of blood throughout the operation.

In thinking this case over the difficulty in making a diagnosis without the aid of a cystoscopic examination is apparent. Here was an old man suffering from hæmatura, loss of weight and anæmia; his prostatic condition, as well as his disturbed rest, due to his rising several times during the night to micturate, seemed sufficient to account for his symptoms. He had no pain or palpable tumour; he had been examined by four different surgeons before seeing me so that his condition was thoroughly investigated, short of a cystoscopic examination. The *x*-ray, I may add, did not afford us any assistance.

This is the twelfth case I have seen in the last fifteen years and so far as I can recall the only one in which hæmaturia was the only symptom present due to the presence of the tumour. The teaching by Grawitz that hypernephromata are due to small aberrant nodules of suprarenal tissue which are included in the renal cortex during the process of development, would incline one to think that these tumours should be found most frequently in the upper pole of the kidney. This in my experience has not been the case. I have often thought it surprising that I have never seen any bronzing of the skin, such as one sees in Addison's disease, where the suprarenals are involved. In one of my early cases, a child of ten, there was a precocious development of pubic hair and menstruation, tending to show that some distinct relationship exists between the suprarenal gland and the development of the sex characters.

Paper: The paper of the evening was read by Dr. H. B.

Cushing on diphtheria. Dr. E. V. Murphy of the Alexandra Hospital collaborated with Dr. Cushing in collecting the material for this paper, which was illustrated by charts and diagrams. The paper appears on page 817 of this number of the JOURNAL.

DISCUSSION: Dr. A. H. Gordon: I have listened with much pleasure to Dr. Cushing's report and congratulate him upon the amount of material which it contains. Many points of interest arise in connexion with this subject. I have never seen the total mortality of the Alexandra Hospital put into figures until now, only the mortality of various years, and I may say that it compares very favourably with that of other hospitals. The diminution in the last year, from 7 per cent. to 5 per cent., is also most satisfactory. Improvement in mortality figures may take place in several ways; for example: in epidemic years there are a large number of cases in the city and we would look for a lessened mortality, for the reason that everyone is on the lookout for diphtheria and cases are brought to the doctor or to the hospital much earlier, and the average mortality is lessened. I can quite agree with Dr. Cushing that there is not a question which can give rise to greater difficulty than the diagnosis of obscure scarlet fever in a patient with diphtheria. In some cases a diagnosis is absolutely impossible and the only thing to do is to play safe and avoid carrying any infection into the ward. Another point is in connexion with albuminuria and nephritis in diphtheria. I cannot recall off-hand the statistics of cases under my own observation but it does not seem to me that 50 per cent. developed albuminuria. My impression is that the percentage is considerably less. On the other hand, the cases of diphtheria which develop a nephritis from the tenth to the twentieth day have always impressed me as serious, and cases of suppression of urine which have developed under these circumstances have in my experience always been fatal. Suppression in the nephritis of scarlet fever has been much less unfavourable. In connexion with paralysis there has always appeared to be a direct parallelism between it and nephritis, and a nephritic from diphtheria I have always suspected as likely to develop paralysis. This is probably the case because these two complications are likely to occur in the same type of infection, i.e., where the cases have been seen late and where there has been a large area of membrane. A peculiarity in connexion with laryngeal diphtheria has been, that although they may have had a large area of membrane and have been seriously ill, they have not developed paralysis. Why this is I am not prepared to say. A suggestion would be that the lymphatic area in the

pharynx may offer a more direct communication with the nerve endings than is to be found in the trachea. As to relapses these are certainly uncommon, but I have observed a few in which a true diphtheria developed within a week after recovery from the first attack. With reference to cases requiring intubation, there is one group suffering from laryngeal stenosis which presents, not the picture of respiratory obstruction, but instead signs of cardiac failure. These patients are pallid and have a very bad pulse and rapid respiration, but few of the sthenic signs of respiratory obstruction. These have passed to the stage of paralysis through weakness and fatigue, and when intubated recover from the presumed heart failure and improve. In one or two instances where we had thought patients had died from sudden cardiac failure, at autopsy the membrane was found obstructing the larynx.

Dr. D. G. Campbell: This paper is most interesting to me, having been a member of the staff of the Alexandra Hospital under Drs. Gordon and Cushing. As a houseman, as far as I can recall, I found the nephritis, as did Dr. Gordon, usually in about 10 per cent. of the cases.

Dr. N. Viner: One question I want to ask and that is with regard to the distinction between false croup and real croup, or laryngeal diphtheria. Under the ordinary measures a false croup will tend to disappear in twenty-four hours, but a very large number of cases of the so-called false croup may last for several days and are very severe. There may be no actual demand upon the accessory respiratory muscles but the stridor is very intense and the cough and speech are characteristic of laryngeal diphtheria. Now cases like that under the usual treatment with ipecac, and probably steaming with Friar's balsam, will improve or not at the end of two or three days, but in view of the fact that we have seen so many of these cases this winter and rather few of diphtheria, and knowing that the proportion of laryngeal diphtheria compared with diphtheria in general is only 10 per cent., a lot of these must have been purely false croup recovering with the usual care and without antitoxine. A great many of these patients are extremely poor and if you consider that in a case of laryngeal diphtheria you want a large injection of serum which costs the people $10, and you cannot send it into hospital until you are sure it is diphtheria, the result is that you may be neglecting a very real case of croup. What is one to do in these cases where you cannot afford to give $10, where there is no improvement in twenty-four hours and you are not sure it is diphtheria?

Another side issue is in connexion with cultures. I have never taken a real culture of diphtheria but I have taken an egg, boiled it, removed the shell and getting between the two soft layers of the outer coats, taken a smear and incubated it under my arm or in the oven. On two occasions I tried it in the oven, but it dried out and was no good but under my arm I obtained a fairly good specimen of the diphtheria bacillus.

Dr. W. E. Enright: I have had a number of cases of laryngeal diphtheria and in two especially I think the children owe their lives to the prompt and efficient measures which were taken at the Alexandra Hospital, both being cases of intubation. In one the child had been going about with slight cough, husky voice, no fever, no pharyngeal signs, suddenly cyanosis set in and about fifteen minutes later on my arrival I found the child dying. I communicated with the hospital, gave him a large dose of strychnine and drove him to the hospital where prompt intubation saved his life, though six efforts were made before it was successful, artificial respiration being carried on and camphor and other stimulants given. The child is now a fine, healthy boy. Another difficult case was in a child who had frequently had croup and the one for which I was called in seemed scarcely different from the others. However, cyanosis appeared and there was considerable obstruction. Here, too, intubation saved the child's life.

I would like to ask as to the advisability, or otherwise, of giving serum in a case of tonsillitis with much exudate not extending beyond the tonsils and where the general condition is not severe. I have heard it said by a number of practitioners that serum in these cases has a very beneficial effect. I hope that some day the city will supply to the poor free serum which can be obtained on a doctor's order. On a number of occasions I have supplied the serum myself, but we do not always feel equal to that. It would be a good move on the part of this Society if some effort could be made to get serum quickly and as a matter of charity for certain patients where it could be proved they were unable to bear the expense.

Dr. W. S. Morrow: One little point Dr. Cushing mentioned interested me very much, He told us that they made a practice of giving a dose of diphtheria antitoxine to every scarlet fever patient as a prophylactic against a combination diphtheria infection. I have had a feeling in several cases where scarlet fever has been severe that it has been benefitted by diphtheria antitoxine and I would like to know whether since introducing that practice there has been any improvement in the scarlet fever mortality.

Dr. G. Hall: With regard to the routine in the hospital I might say a word: the children are so well trained that a little chap about five and a half years old in a house I was visiting lately, on hearing that I was a doctor immediately got up on a chair and proceeded to show me his throat as a matter of course. One thing I wanted to ask Dr. Cushing and that was about the "black" diphtheria. There seems to have been a severe epidemic in a certain district of the city some years ago and the people still talk of it as the "black" diphtheria. I would like to know if this was the hæmorrhagic form.

Dr. F. R. England: I remember very well in the days before we had antitoxine, a malignant form of diphtheria which frequently showed a purpuric skin eruption. These cases were generally septic cases, the lymphatic glands of the neck became greatly swollen and I have even seen a condition of noma or necrotic destruction of the tissues of the cheek and nose appear within a week of the onset of the disease. Regarding antitoxine: Roux's serum, made at the Pasteur Insitute, was for many years, and I think is still, available in this city free of charge to those who are unable to pay for it and it is supplied by the French Government. Years ago before the introduction of antitoxine, when intubation was more frequently practised than it is now, my experience led me to the same conclusion as expressed by Dr. Gordon, namely, that the cases which showed cyanosis were the more favourable ones; the cases presenting symptoms of heart failure with blanched surface, limp, with pinched features, were the more unfavourable cases always demanding prompt treatment by immediate intubation.

Dr. F. A. L. Lockhart: One method of culture which has been omitted to-night is the extremely simple and practical one introduced by the late Dr. Wyatt Johnston, that of taking a smear upon an ordinary piece of uncooked potato. You then make a very good apparatus for growth of the germ by taking an ordinary cake or bread tin, place a small electric bulb attached to a wall cord in the tin and leave it in all night. In the morning you will have a very good growth on the potato if the germ is there. It is extremely important that the throats of these children should be examined when suspected and a bacteriological examination made wherever possible.

Dr. H. B. Cushing: I made one error in my paper: Dr. Gordon was right when he stated that the cases of albuminuria were not as numerous as I stated. I should have said 30 per cent., and not 50 per cent. That includes all cases that showed albumin in any

form at all. My experience with nephritis is not in accordance with Dr. Gordon's; cases that I have seen have almost uniformly cleared up and rarely lasted more than a few days. I have no statistics as to the question of the occurrence of paralysis in laryngeal cases. Severe laryngeal cases with obstruction do often pass through a stage where they have pallor and resemble cases of cardiac failure when death is imminent. As to the diagnosis of spasmodic croup from diphtheria I cannot give much help. It is a very difficult question; cultures do not help you because they take too long and are often negative because you don't get down to the membrane. You have to go by the history of development. Any croup which lasts more than twelve hours with no improvement is probably diphtheria and it is safe to treat it as such and give injections. In the making of cultures on eggs we have had some experience and they are very satisfactory. I see no reason why diphtheria antitoxine should have any effect in any disease except true diphtheria. The blood serum itself might have some effect if given in sufficient quantity, but why antidiphtheritic blood serum should have an effect in scarlet fever I do not see. Most large cities have free serum and culture media, it is a pity we do not do it here. As to "black" diphtheria it is a popular term of course and undoubtedly many were the hæmorrhagic cases spoken of. On the other hand the diphtheritic membrane is often black without it being a critical case or the prognosis bad.

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Annual Meeting, Edmonton, September 21st and 22nd, 1916

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PRESIDENTIAL ADDRESS

DELIVERED BEFORE THE CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS

By Hon. J. W. Daniel, M.D.

St. John, New Brunswick

I AM sure I am voicing the sentiments of those present when I say that we are both honoured and pleased by the presence on this platform this evening of His Honour the Lieutenant-Governor of this great province and of Monsignor Pelletier, the learned Rector of this celebrated university. Their presence here to-night is a recognition of the great importance of the subject we are dealing with, and when we have with us the support of the heads of both Church and State, we feel greater encouragement to continue on vigorously with our campaign.

Our Association is fortunate this year in holding its annual convention in this ancient and historic city of Quebec, which sitting queen-like on its most striking, picturesque and commanding site, guards at once the entrance to the mighty St. Lawrence and to the interior of this great country we all love so much, and in whose prosperous and happy future our hopes and aspirations are centered. It was from this city as their base in years long gone by that those gallant and hardy pioneers and adventurous spirits set out to explore the pathless forests, the unnamed rivers and lakes, the spreading prairies and snow-capped mountains which make our land, and reckless of danger from beasts of prey or human savage mapped out the country and blazed the way for the civilization which has followed in their steps. We who are visitors to this city may be excused if we look upon it somewhat as a shrine in which is embalmed the memory of those gallant and enterprising Frenchmen, cleric and lay, whose heroism and devotion consecrated the early history of this country. They rest from their labours and their works do follow them.

We are also fortunate in meeting at the same time with the Public Health Association of Canada and the Services Sanitaires de la Province de Quebec in joint congress. These associations with our own are working together for a common object. The problems with which they are dealing are those which confront us in many particulars, and the solution of the problems which stand in our way will solve half the problems of those interested in public health matters generally.

We are meeting to-day under the shadow of a great and terrible war, which is not only deluging Europe in blood, but has brought and is still bringing sorrow and bereavement into very many of the homes of our own land. We are proud of our heroic dead, and for them it may truly be said, "To live in hearts they leave behind is not to die"—nay, rather is it to write their names in the list of the immortals whose fame never dies. Whatever other results may follow as a result of this conflict, one thing is certain, viz., that the great English and French nations will know and understand and appreciate each other more fully than they have ever done in the past, and that the happy alliance now existing in the face of a common danger will bind them together in indissoluble bonds for very many years. That brilliant American correspondent, Frank H. Simonds, referring to this subject not long ago, said this: "It is a fact of more than passing importance that the two great democratic nations of Europe, nations with widely different ideals of democracy, but with a wide area of common ground, should thus be united by bonds which will endure beyond the war and influence human history for long years to come. In this alliance there exists a real and sufficient counterpoise to that German peril which has threatened all democracies, ours as well as theirs." In this country where these two great races form such a large proportion of the population, anything which enhances their mutual understanding and appreciation must be doubly welcome.

We did not meet last year as you know, because of the large number of the medical profession in all parts of Canada who found themselves constrained to answer the country's call and place themselves at the disposal of the military authorities, and not only so but the thoughts and energies and sympathies of all were turned in the one direction, and while all could not take on themselves the active work of the soldier, all could do something to alleviate the hard conditions in the trenches, by providing comforts and needed aid for those at the front or those who are prisoners of

war, and to look after the relations and dependants left behind in the necessary absence of their natural protectors.

All this great and absorbing interest taken and rightly taken in the great war has possibly resulted in a temporary weakening of the interest shown in those most important undertakings which this Association has especially at heart, and some of our institutions in different parts of the country may perhaps show the result in a lessening of the financial support given to them. There should be no discouragement, however, on this account, for if this weakening does exist it can be only temporary.

It is most encouraging in looking over the situation to notice how many institutions and organizations have been put into operation in our fight against tuberculosis, and to find that even the past year has been no exception. This great province has several notable monuments to the enlightened interest which many generous and philanthropic people have taken in this most important subject, and the noble work done by the Dispensary in this city, the Jewish Sanatorium and the Laurentian Sanatorium at St. Agathe, the Sanitorium at Lake Edward, and the Dispensary in Montreal bear eloquent testimony to the fact that in this province as well as the others tuberculosis is looked upon as the great modern menace to life and health.

I cannot refrain from referring in this connexion to the great and generous assistance given by our late president, Colonel Burland and members of his family in the founding and carrying on of the Royal Edward Institute which is doing such a successful work in the city of Montreal. The untimely death of Colonel Burland, coming as it did in the midst of his activities in organizing the Canadian Red Cross for war service, will be felt as a severe blow not only by this Association but by all those who have the physical and moral betterment of their fellowmen at heart. Many other generous-hearted citizens in the province have given and are giving freely of their means to this end. But should this great movement be left so entirely to the initiative and the burden of support be left so entirely on the shoulders of the comparatively few open-hearted of our people? It appears to me that if there is one thing that should appeal more strongly than another to the provincial and municipal authorities it is the public health. It is upon the community as an organized whole that the direction and cost of this campaign should mainly fall, and it is gratifying to know that these authorities all over Canada are beginning more and more to appreciate that fact. I was pleased to hear in the report

read by our secretary this afternoon—a most encouraging report—that this important city of Quebec has opened a municipal hospital for the care of advanced cases of tuberculosis. This city is to be congratulated on its wisdom in thus removing from their homes these cases, which could not help being a constant menace to the lives and health of those by whom they were surrounded; and thereby reducing the number of foci of infection which must constantly be spreading the disease. Nothing in connexion with our campaign is now more thoroughly appreciated than the fact that the advanced cases must be segregated, especially among the poorer people of the community who are forced to live in crowded tenements with insanitary surroundings, if we ever expect to win success.

As far as the provincial government of this province is concerned, I do not know to what extent it is aiding or directing in the fight against tuberculosis, but I can heartily congratulate His Honour in presiding over a province that is in the happy position of having a very considerable surplus of income over expenditure, and that consequently, is in a very good position indeed to see that adequate measures are taken to obtain good results, and check the ravages of this disease. In the end it appears to me that the State must recognize its responsibility in the matter and use its authority as well as its means if hope of a successful issue is to be entertained. It would seem that if we are to win out and prevent this preventable disease, more must be done than even providing dispensaries, sanatoria for incipient cases, and hospitals for advanced cases—important and absolutely necessary as these are. It appears to me that it must be made possible for the poor as well as the rich to have their place in the sun, for the poor as well as the rich to live in houses that have adequate and proper sanitary appliances, that they should have room to breathe and plenty of fresh air and sunlight. In other words, that all persons in the community should at least have their chance, and at least be accorded the possibility of growing up healthy and strong. There should be no slums in Canada. Till we get rid of the slums, I am afraid we shall not get rid of tuberculosis; till we let in the sunlight and the fresh air of heaven into these darkened and unwholesome dwellings, and get the people educated in every day elementary and necessary sanitary knowledge, this and other diseases will linger and complete success will be impossible. It is a large undertaking. It means the solving of the housing problem in congested areas; it means the constant inspection of the young, especially those of

school age, the inspection of the schools and their being kept properly ventilated and in a sanitary condition, it means the control of industrial shops and places where especially large numbers of children and adults of both sexes are employed and the rigid enforcement of rules to the end that those places of employment should be kept in such a sanitary condition that the health of the employees should not be endangered.

It is a big problem, and it is because of its great size and importance, that it seems to me that it can only be solved by those having not only the means, but the authority as well, and these reside in the State, and the State can deal with it on broad and scientific lines. Notwithstanding the greatness of the problem, however, and the fact that we believe further methods are necessary, it is most encouraging to note the very considerable amount of success achieved by means of the agencies already adopted. I am naturally better acquainted with what is being done in my own city and province than elsewhere and am glad to be able to report a gratifying success in lowering the deathrate from pulmonary consumption in the city of St. John.

A number of years ago, I had the honour of inaugurating the St. John branch of our Association and ever since it has been in active operation and doing a good and successful work, operating a dispensary and employing a visiting nurse. In this connexion, I would like to say that the work of the visiting nurse cannot be too highly esteemed, for it is to her that we have chiefly to look to impart that elementary sanitary knowledge to which I have referred. We are reaping some good results in the efforts put forth, in a greatly decreased deathrate from pulmonary consumption, for while the number of deaths from this disease in 1900 was 92 out of a total 775, in 1915 it was only 58 out of a total of 855; that is the percentage has fallen from 11·8 in 1900 to 6·7 in 1915; and this improvement has been gradual and continuous—I have the figures with me for each year, but will not weary you with reading them. But while the above statement is satisfactory as far as it goes, and the general mortality rate from tuberculosis is much reduced, this improvement does not extend to the deaths from the disease in children under ten years of age, in fact, I cannot say that here there is much change to be noticed. I think this emphasizes what I have said with regard to the necessity of getting into closer touch with the family, and of following up the living conditions and housing arrangements of the people, and also of getting advanced cases removed from the family circle. It emphasizes too the need of

inspection of schools and pupils, which is carried out in some places, while it should be carried out in all.

LOCAL BOARD OF HEALTH

SAINT JOHN, NEW BRUNSWICK, JULY, 1916.

DEATHS FOR PAST SIXTEEN YEARS

Years	Total Number of Deaths	Under Ten Years	From Tuberculosis	From Pulmonary Tuberculosis	From Tuberculosis Under 10 Years
1900	776	240	118	92	14
1901	736	246	103	88	9
1902	706	190	89	72	11
1903	771	256	95	75	8
1904	739	213	115	89	17
1905	762	200	106	86	12
1906	775	236	90	65	12
1907	766	237	90	63	3
1908	815	251	115	75	13
1909	769	231	110	81	11
1910	761	247	110	88	16
1911	741	211	84	70	11
1912	672	202	90	81	10
1913	824	278	76	60	10
1914	771	276	82	72	8
1915	855	258	78	58	12

T. M. BURNS, *Secretary.*

Our city has recently provided a splendid hospital for advanced cases at a cost of $104,000 for building and equipment, and maintains the institution as well at a very considerable outlay. It contains fifty-seven beds, and I believe they were all occupied very soon after the building was opened. It has private rooms where patients can pay for their accommodation and treatment, but most of the beds are free. This action by the municipality of St. John is one that I think is likely to be more generally adopted in the future by municipalities or combinations of municipalities, and it is one of the most useful and important that they can be engaged in, and cannot help but have a marked effect in lessening the existence of this disease, I hope to find as one result in the near future an absolute reduction in the mortality of children under ten years of age, from pulmonary consumption, in the city of St. John.

It is said, and I have no doubt correctly, that the young respond more quickly and more completely to proper treatment, than those of adult age, and that the chances of permanent cure are much

greater among them than among those who are more advanced in years. If I may be allowed to express an opinion on the matter at all, I should certainly say that we should concentrate our attention somewhat more on the welfare and living conditions of the child, in the future, than we have done in the past.

I notice in the programme of the Canadian Public Health Association a paper dealing with the "problems relating to the returned soldiers". This is a matter in which as to one of its aspects at least, this Association will be greatly interested. If it be true as stated that in a very great number of post-mortem examinations of people who have died from various diseases, over 90 per cent. show that they have suffered at some time in their lives from a tubercular lesion, then we may reasonably expect that a number of our soldiers, though quite healthy and sound on enlistment, will find that although they may escape wounds from hostile missiles, the hardship, deprivation, exposure to wet and cold in the trenches and the asphyxiating gas, will so reduce their resistance, that they may become the victims of tuberculosis. This has already proved to be the case. I am sure this Association will agree that the Government will be well advised if they give the returned tuberculous soldier the benefit of sanatorium treatment for a sufficient length of time, before he is sent to his home, this action being taken both for the benefit of the soldier and the safety of his family as well. In fact I am glad to know that the Hospitals' Commission have already taken action on this line, and I am sure we shall be glad to strengthen their hands in this particular and to impress them with its very great importance.

In looking over our printed annual reports for the past few years I have been very much struck with the very able addresses and lectures that have been delivered by the experts and scientists who have so kindly appeared before our Association and given us their views on tuberculosis in its various aspects, and I am pleased to notice that on this meeting's programme, we shall also have the benefit of hearing gentlemen of eminent and scientific attainments, to whom we shall listen with pleasure and profit. The important work in which we are engaged is of incalculable benefit to our population, the success already attained is so great that every encouragement is given to further and more extended operations, and I sincerely believe that our present meeting will only increase our determination to persevere in our efforts to wipe out this great menace of health and happiness in our midst.

PRESIDENTIAL ADDRESS

NEW BRUNSWICK MEDICAL SOCIETY

By Walter H. White, M.D.

St. John, N.B.

I DESIRE in the first place to express to you my very hearty appreciation of the honour you have conferred upon me in electing me to the important office of president of the New Brunswick Medical Society. It should be the laudable ambition of each member some day to occupy the chair, and with that object in view to attend the meetings regularly and take an active part in their transactions.

It has been the custom, on occasions such as the present, to give some brief review of the chief medical efforts of the year, but to-day, in our own country at least, the abnormal conditions brought about by the great war have so disturbed the peaceful advance of science that its flame is flickering low and almost completely obscured by the smoke of the battlefield. Human skill and intelligence are being largely directed by the chief nations of Europe toward the destruction of life rather than its preservation. Plowshares are being beaten into swords, and education means learning how to kill. Our boasted civilization and our peace tribunals have culminated in the pitiable spectacle of millions of so-called Christians flying at one anothers' throats.

At such a time we contemplate with pride and satisfaction the work accomplished by our confrères on the field of battle and in the military hospitals. The conditions are unlike anything before experienced, and older methods have often failed to give the results expected of them.

The war in South Africa, where the last British experience in military surgery was gained, was conducted in a country practically free in the open spaces from pathogenic organisms.

Delivered at the opening session of the annual meeting of the New Brunswick Medical Society on July 18th, 1916.

The most desperate wounds healed readily and extensive injuries to vital organs were often followed by complete and rapid recovery, under these circumstances the treatment was largely expectant.

How different the conditions in the present conflict. The western front, where the British lines are placed, runs through a country, the most densely populated in Europe, which for centuries has been under cultivation. The soil is greatly contaminated, and produces a varied and particularly dangerous flora. To this is added the subterranean methods of warfare rendered necessary by improved offensive, with a result that most wounds are infected and extensive mutilations and death are common. The problem of the infected wound, therefore, is the surgical problem of the war. That this will be solved in such a manner as to be of the greatest possible use to the civil surgery of the future, there is no doubt, despite the great divergence of views among military surgeons at present. The large experience in fractures will also be useful, and in this and other lines as well the experience gained at such heavy cost will in the end mitigate human suffering. Let us hope that one outcome of the war will be the better development of British, and I mean British in its widest sense, facilities for post-graduate study, along general and special lines. There have been in the past too many pilgrimages to Vienna and Berlin as the Mecca of the medical man. Too much prominence has been given the German language and literature in our studies. "Distant hills are always green," and the summer exodus to the clinics of the Huns has become popular and fashionable. All this must be changed. London, Edinburgh, Dublin, to say nothing of the larger cities of the Empire, possess a wealth of clinical material which properly used could satisfy the most exacting, and as the trade relations and general economic conditions will ultimately be arranged for imperial benefits, so, in matters of medical education we should raise up among ourselves a standard than which there can be nothing higher. We may forgive, but this generation can never forget.

And now a few words about our Society. It was founded in 1881, with the double purpose of creating an electorate for five members of the Council of Physicians and Surgeons of New Brunswick, then first established by law, and also to provide the means by which members of the profession in the province might meet together as a scientific body and discuss questions of mutual interest. Previous to the passage of the Medical Act, there was no protection for the public against the quack and the impostor, but

by that enactment the subjects of matriculations, professional education examinations and registration were placed in the hands of the council, together with other important duties.

There is, I regret to say, in some quarters an entire misunderstanding as to the purposes of the Medical Act. It is claimed that it constitutes us a close corporation and that the examinations are used to discourage aspirants, and so lessen competition. Nothing could be farther from the truth. The aim and object of this important piece of legislation is to guarantee that each one who undertakes the responsible duties of a healer of the sick brings to their discharge a reasonable amount of skill and knowledge. I think an examination of the records will show that few candidates are rejected, in my opinion far too few, and they have shown themselves to be insufficiently trained for the practice of their profession.

It is the duty of the Medical Council, as well, to submit an annual report to the Medical Society, and once in every three years an election is held.

I mention these facts to remind you of our medico-political importance, if I may use such a term.

On looking over the programme placed in your hands to-day you will observe that the contributors of papers are, without exception, registered practitioners in New Brunswick. This should be, in my opinion, the normal condition. Doubtless exceptions to the rule may often be made with advantage, but I am thoroughly convinced that in this matter the Society should be self-supporting. It is a great pleasure to meet at our gathering members of our profession from other places, but that we should sit in the gallery while they occupy the stage is scarcely fair to ourselves, and we can have no cause for complaint if we are taken by the public at our own valuation.

The Maritime Medical Society, after a somewhat brief life, has gone out of existence, I think wisely. The Canadian Association meets so often in distant places that a regular attendance by many New Brunswickers cannot be expected. It, therefore, remains for us to make this Society a credit to ourselves and the Province. A live society is no mean educational factor, and is a stimulus as well.

We have no Medical School here, nor can we expect to have one. The larger centres of population, where clinical material is abundant, can alone enjoy that great privilege. It becomes, then, even more important for us to take advantage of all the educational

facilities within our reach. And that brings me to the next and last subject on which I shall touch—the subject of hospitals.

The outstanding feature of the medical practice of to-day is the increased importance of hospitals. The wide scope of medicine has made it impossible for one individual to attain excellence over the whole field, and while the general practitioner does still remain the mainstay of the sick, more and more the principle of the division of labour is being introduced. That this is beneficial, no one can deny, and for its development and useful employment a properly equipped hospital is essential. I do not advocate a narrow specialism, but at least medicine and surgery may be with advantage separated, and pathology and radiography are sciences by themselves, not to be undertaken successfully by practitioners of medicine.

In order that general practice may reach the highest level, the services of experts in these lines should be available. It is not many years ago that the St. John General Public Hospital was the only institution of its kind in the province. It was opened for patients in 1865. Its birth was difficult, and, indeed, it was forced upon an unwilling community by a few far-sighted gentlemen in spite of protest from the Common Council and the press. Under such circumstances it could scarcely expect to be popular. And it was not. The taxpayer complained of the increased rate, while in the eyes of those for whom chiefly it was erected it ranked with, or a little below, the other parochial institutions, the poor house, the jail and the morgue. Even the profession failed, in some cases, to realize that a great step forward in the medical community had been taken, and were far from anxious to fill positions upon its staff. This state of affairs, after fifty years, has to some extent, but to some extent only, been overcome. In other cities we find a pride taken in the hospitals, every facility in the shape of buildings and equipment is provided for regardless of cost, while in St. John we are handicapped in every way. It is true that our end results compare favourably with those of our more fortunately situated colleagues, but unfair that we should be compelled to "make bricks without straw". Even the efforts of the Commissioners to provide the beginning of a proper building were successfully opposed by some gentlemen in authority, although it is well known that the hospital is overcrowded far beyond its capacity.

I write these words in the hope that we may be able to arouse public opinion in this matter, not only in St. John but in the other places where hospitals are established and need further support, that we may be provided with the means of doing better work.

For more than a quarter of a century I have actively practised in this institution, and I may on that account, if on no other, be given credit for knowledge whereof I speak. For many years I have been a "voice crying in the wilderness" for hospital improvement and reform, and if, in the end, the people, who are the ones most interested, awake from their lethargy in hospital affairs, I shall not have spoken and written in vain. A well-equipped hospital staff means an active, progressive staff, and the standard set there elevates the standard of the profession at large.

Who are the gainers by this? The public. A man may sleep more securely in his bed at night, knowing that if he or a member of his family should be seized with a sudden and dangerous ailment the medical or surgical treatment at home is the best that can be procured. Surely the people of St. John will be satisfied with nothing less. The increased tax constitutes a life insurance premium, and a cheap one at that. We spend the public moneys freely to encourage trade and the accumulation of wealth; why not spend a little to safeguard better than they are now safeguarded the health and lives of the people, which are the two greatest assets of a nation? I believe the building and equipping of a modern hospital will do much to accomplish this. While the strengthening of armies and military efficiency are at present the largest public question, let us not forget the lines so often quoted, and so familiar to all of you:

"A wise physician skilled our wounds to heal
Is more than armies to the public weal."

Up to September 1st, 1916, the total casualties among the Canadian Forces are estimated at 37,861. The number is made up as follows: killed in action, 5,998; died of wounds, 2,248; died of sickness, 398; presumed dead after missing six months, 723; wounded, 27,212; missing, 1,282.

PSYCHOGENETIC CONDITIONS

By Colin Kerr Russel, Major, C.A.M.C.

Granville Canadian Special Hospital, Ramsgate

I AM using this term to include those cases of disability which have, as the main symptoms, motor and often sensory disturbances and which, on thorough examination of the nervous and locomotor systems, show no corresponding signs of organic disease, and which the subsequent history shows to be of a purely mental origin.

These cases may be divided into two main groups:

1. What we have in civil practice diagnosed as hysteric.
2. Malingering.

It is these two conditions which I wish to discuss. It is rather interesting to me to compare my six months' experiences in a general hospital in ——— with almost the same time in this hospital in England. One or two facts seem to me to stand out most prominently:

1. In ——— we never saw hysterical manifestations in a man who had received a shell or bullet wound.

2. In ——— at the time of the ——— affair, during the shooting season one saw numerous cases of men who were brought in apparently deaf and dumb or blind, who lay in bed in a state of nervous exhaustion—possibly throwing the head or limbs from side to side—who would apparently pay no attention to anyone speaking to them, but one saw very few psychogenetic paralyses of limbs, and in every case I did see, I was forced after careful observation and study to come to the diagnosis of malingering rather than that of hysteria.

For example, one man was admitted to my ward with all the outward and visible signs of a right hemiplegia of a severe type. The history of the onset was suggestive. After a foot bath parade, when lined up, the order was given "right turn". He could not "right turn" so he had to "left about turn". Just previous to this he had had pain in the left shoulder. He was very soon made to understand that it was not of an organic nature, and in a confidential interview, he gave me the following story: He was a regular in the

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Imperial army and his time, seven years, would be up in one month. Since joining the army he had married and now had three children. He wished to leave the army at the expiration of his time. In spite of my explanation that that would be impossible, as he would naturally go on the reserve list and the reserves had been called out, he maintained that it was quite possible—perhaps later he would join the army Service Corps—and so on. His method of getting out of the Army seemed obvious, but did not work.

I also saw quite a number of cases of convulsive seizures, some, of course, genuine idiopathic epilepsy, but others definitely psychogenetic, and it was in the consideration of these cases that I first came to the conclusion that there was a very close association, especially in the early stages, between hysteria and malingering. In both conditions, at the commencement, there is the same small element of deception, which, if not recognized and corrected early, in the one case, grows enormously because the patient is not deceiving himself; in the other case, the deception does not become so obnoxious, at least, because the patient has finally, by a process of auto-suggestion, or even auto-hypnotism, aided possibly by suggestions of casual examiners, managed to deceive himself as well.

For example, in which category would one place the following case: A young man was admitted to my ward in No. 3 Canadian General Hospital with a diagnosis of epilepsy. The following day we got orders to empty the hospital in preparation for new cases. I sent him to the Convalescent Camp, thinking he could be observed there. In the course of the week he was returned with a note to say he had had two attacks, which were observed by the medical officer in charge, and was now in an epileptic condition and that they could not keep him. I camped in that ward until he had another attack. Fortunately I did not have to wait long, and I saw that it was not of a genuine nature and I put it up to him. His story was this: He had been at the front for twelve months, since the days of the German retreat, and had had no leave. He felt that it was due him. Moreover, he showed me a letter from his sister, stating that his brother had been severely wounded, and it was a question whether his leg could be saved. His aged mother had taken it very badly and was very ill and was praying for his return. He said when he thought of all this he felt so badly that it just seemed to get worse and worse until he had an attack. He admitted that he could control them. I told him that the Army authorities tried to be just and if he had been at the front for

twelve months without leave, it was coming to him, but he must realize that to behave in such a way was really doing the essential part of himself a greater hurt than if he were wounded, and so on, and that if he would play the game, I would send him to the Base with a recommendation for leave. I kept him in a week or ten days longer and the change in him was remarkable. He was bright and active and cheerful around the place, and had no more attacks. Which category is such a case to go in?

Now, in England, I have found a great number of cases of paralysis of either one or both legs or of an arm—of a psychogenetic origin—and relatively very, very few of these have received wounds. Let me detail two histories, as I got them from the patients. I do not propose to show the patients for the reason that they have given me their confidence and I feel strongly that I have no right to abuse it. But if any of you have any doubts you may go and inspect our shrine, which is presided over by Major Smith and myself, and you will see quite a number of crutches, sticks, plaster jackets and splints which have been donated by the faithful. I might add that several beds should have been added to it, but the Government is no respecter of shrines.

One young man came in on crutches, he had become paralysed completely in his right leg and partially in his left. Since using crutches he had developed crutch paralysis in his right arm. There were very marked vaso-motor changes in his right leg and arm, with loss of sensibility to pin-prick. He was told that there was no reason why he should not move all his limbs perfectly. He would not believe this and said that he had tried, not any longer ago than that morning, when in the lavatory alone and could not move them. After talking to him (and it is essential that this be in private) he was soon persuaded to use his arm and to walk perfectly, and he has done so ever since. His story was this: Whilst in the trenches, he had an attack of sharp pain in the right knee. He volunteered the statement that he had not used his leg as much as he might have and it gradually became more and more useless and his left leg became affected. When he began to use crutches he developed crutch paralysis in the right arm. He had been paralysed some three months. He said the reason for his not using his leg was not on his own account, but on account of his mother at home. Since enlisting his grandfather had died, his two brothers had enlisted, and his mother was left alone and he wanted to get home to her. He seemed really grateful for his cure.

Another case shows another source of suggestion: A young

man was admitted with paralysis of both legs of six months' duration. Examination showed a not very robust youth. He had slight power of movement at the knees, none below. Loss of sensibility to pin-prick of the stocking-like variety from knees down. One could stick the pin right through a fold of flesh here and there was no bleeding. Reflexes were not pathological. Although he had to be carried into the examining room he walked back to his ward, up some stairs. He told me the following story: Three of his brothers were at the front. He had paid $150.00, Western charges, to have his teeth repaired in order that he might be acceptable. After enlisting he had married and had not been able to get his separation allowance. His wife had become pregnant. On a route march from Shorncliffe, during a heavy rain storm, he had to fall out. On reporting sick to the medical officer who happened to be doing locum, he was told that he had weak feet and ankles, and they would always be a source of trouble. He lay around the huts not getting much treatment. Excused duty. Everything wet and cold and he proceeded to get worse. Was admitted to hospital and had been in bed six months and came to us on a stretcher. This man was evidently, in the first place, keen enough, but in the interval he had been supplied with a strong and natural incentive to stay behind. The suggestion of the medical officer fell on fertile soil and sprang up and flourished.

One other patient I wish to bring up. I had for a few days a sergeant who suffered from shell shock and had been in hospitals ever since the end of May last. He was still troubled with marked shaking whenever he raised his leg from the ground. (He had walked in supported by a silver-headed cane.) It was evidently of a purely functional nature. This was explained to him and he was persuaded to stop it and walked out perfectly normally, saying that he would do without his cane. I suggested that it was customary for cases that were relieved of the necessity of using crutches or stick to donate them to the shrine. I was diffident about it because it was a fine cane and must have cost at least three dollars. However, my friend, the sergeant, evidently begrudged the shrine his cane and made a hasty retreat, carrying his cane in front of him, before anything more could be insisted on.

I could quote other cases, but time forbids. There are, however, questions we must ask ourselves:

1. Why do we so seldom see psychogenetic paralysis—apart from malingerers—in ——— and yet see so many here? You may say it is because I am in a special hospital here where these cases

are collected. Possibly there is some truth in that, but I do not believe it is the whole truth. Others in ——— with long service have told me that they have had the same experience there. It is a question to consider.

2. Why do we so seldom see psychogenetic conditions in men who have received a wound and never in cases where the wound is serious? The reason seems to be obvious. They have received an honourable wound and have earned their passage to "Blighty", and there is no reason for them to invent any further disability to attain their desire.

3. Why did my friend, the sergeant, begrudge his silver-headed cane to the shrine in being cured? The next patient, who had a lesion of the sciatic, replied, when he was asked if he would give a similar cane to the shrine if we cured him in fifteen minutes, "Just try me—I would give a deal more than that."

Was it not that in spite of his disability of almost a year's standing, he felt himself that it was not as serious as it looked? I repeat, therefore, that in the beginning of all these psychogenetic conditions, there is primarily an element of deception. In some cases, who may be specially constituted mentally, they manage at last to deceive themselves—in others one finds the pure malingerers. In the first group it is difficult to determine how much the patients themselves are deceived, but one can readily realize that the longer they are allowed to go on deceiving themselves, the more difficult will be their disillusionment.

THE seventh annual meeting of the American Association for the Study and Prevention of Infant Mortality will be held in Milwaukee on the 19th, 20th and 21st of this month.

MALIGNANT ŒDEMA

By Lieutenant-Colonel F. McKelvey Bell, M.D.

Acting Deputy Director-General of Medical Services, Ottawa. Formerly Surgeon to No. 2 Canadian Stationary Hospital, France. Surgeon to St. Luke's General Hospital, Ottawa.

MALIGNANT œdema (septic gangrene), while a very rare disease in civil life, is comparatively common in military hospitals at the front. During a period of six months, while in France, no less than twelve cases of this condition came under the observation of the writer.

The reasons for the incidence of any anaërobic infection in gunshot wounds during the present war are apparent:

(*a*) The battle front was formerly thickly populated, and is largely rich agricultural land.

(*b*) Men who have to sleep on ground which is highly infected both by manure and the rotting carcases of men and animals, are bound to have their clothes contaminated.

(*c*) Shrapnel and pieces of high explosive shells carry scraps of infected clothing deep into the wounds.

(*d*) The depth and irregularity of the wounds favour the growth of anaërobic organisms.

(*e*) The impossibility of immediate treatment in many cases.

As is well known, during daylight the Germans will not permit the collection of the wounded in any area, which they can cover with their gunfire. Men often have to lie where hit for several hours, until nightfall permits their collection by the stretcher bearers.

Septic Gangrene is a disease which, for rapidity of onset and disastrous effect, has few equals. If the surgeon is to save his patient, treatment must be instituted from the moment the disease is *suspected.* One must never wait to confirm suspicion by bacteriological examination; it will usually be too late for treatment if one looks for bacteriological confirmation, and one must remember,

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too, that a negative laboratory report does not necessarily mean that the infection is not present. The difficulty of getting a definite swab from a deep or irregular wound is obvious.

The mortality of septic gangrene in other wars has been as high as 90 per cent. It will not be nearly so high in the present war. Where treatment can be instituted at an early moment, the mortality should be exceedingly low.

The disease originates most frequently in a large bullet or shell wound; usually deep in the channel of exit. Its onset is insidious, but rapid.

Symptoms

If we view the symptoms from the order of sequence in which they may be observed, the first noted is a vile, pungent odour of remarkable penetrating power, capable of permeating a large hospital ward. It can only be compared to the odour of dead blood in a large wound when scented at close range, but intensified a hundredfold.

This symptom is so prominent and characteristic, that when once encountered, it will never be forgotten. The sense of smell has been accredited with being the most powerful aid to memory; and such a recollection as this is not likely to be erased.

The wound is black, instead of red; and, at first, appears to be filled with decomposing blood clot, from which on pressure, or often without, bubbles of gas issue.

The surrounding skin for several inches is often dark in colour, a smooth, spreading pseudo-ecchymosis about the colour of iodine stain. The mottled appearance of true ecchymosis is absent. (From the surgeon's point of view at the commencement, the limits of the colour may be taken to represent the limit of the disease.)

In a few hours the wound may present one of two phases; it either becomes dry and black, having an appearance of being seared with the actual cautery; or in other cases it presents a dark, greyish slough, not unlike diphtheritic membrane.

At the end of twenty-four hours, the limb commences to swell, owing to gas in the tissues; and in a few hours becomes markedly "œdematous".

On pressure, one can sometimes—but not always—elicit gas crepitus. The limb gradually becomes enormously enlarged, and the skin, now drawn taut, presents a shiny appearance.

At the end of forty-eight hours, if the patient lives so long, the

face assumes a sickly greenish pallor and the expression becomes anxious. There is no change in the mentality; patients remain rational to the last.

The pulse presents the usual features of a grave toxæmia. In the cases under observation, it ranged from 104 to 128.

While the temperature in these cases ranged from 100° to 105° F. it is quite possible that most of this fever was due to complicating staphylococcic organisms, for in the most severe case of all (which, by the way, recovered) the maximum did not exceed 101°. The respirations were in direct ratio to the temperature.

Treatment

The treatment, to be useful, must be radical and immediate. Every hour lost increases the chance of death, out of all proportion to the apparent danger.

In these cases, deep incisions, under chloroform, were made almost to the bone by means of a six-inch blade amputation knife; due care, of course, being taken to avoid main arteries or nerves. These incisions were four inches to six inches in length; they were afterwards kept wide open with fenestrated rubber tubes, one inch in diameter and six inches long, passed on transversely through the muscle to a counter incision. Not less than three, and in one case six, of these large incisions were made.

The wounds were then irrigated with large quantities of H^2O^2, followed by a combination of H^2O^2 and acid carbolic 1-100, in equal parts.

The wounds were packed lightly, but only temporarily, with gauze, which was left in just long enough to check bleeding. Dressings and irrigation were repeated every three hours, night and day. After the first dressing no gauze was left in the wound, but a very thin layer, (two or three strips only) was laid over the opening to exclude dust and flies. No bandages were used. A high cradle held the bed clothes up, in order to admit plenty of air, and where possible the wound was exposed to direct sunlight.

The wounds have a great tendency to close, on account of pressure of gas in the tissues; and this unless prevented by the surgeon, will bring about the anaërobic conditions we are trying to overcome. Moving the rubber tube about, and spreading the tissues by inserting a pair of closed artery forceps into the wound, and withdrawing them while open, will prevent this accident.

Prognosis

Of the twelve cases treated, four died. The first of these because, as it was only a skin abrasion, and the disease was new to us, we treated it superficially only, without incisions.

Two other cases were moribund on admission to hospital. These should not be included in the statistics, as they were both quite pulseless, and radical treatment was not attempted.

The fourth case was a compound comminuted fracture of the femur, at its upper third. An attempt was made to save the limb, and several valuable hours were thus wasted. The amputation, which later proved inevitable, was not successful in checking the spread of the disease I believe that, had the amputation been performed early, this man's life would have been saved.

The impression of the writer is that in cases of septic gangrene complicated by compound fracture, amputation is the safer procedure.

Results.—In this small series 80 per cent. of all cases treated recovered; 90 per cent. of all cases treated by deep incisions, H^2O^2, etc., recovered.

Special night and day nurses were employed on all these cases, and this, undoubtedly, was a strong factor in the good results secured.

EPIDEMIC MENINGITIS

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OWING to the development of a number of cases of this disease in the Canadian and British armies an opportunity has arisen for the careful study of the etiology, means of spread, and treatment of this affection. Practically all are agreed that the causal agent is the diplococcus intracellularis, more commonly named the meningococcus, though this etiological relationship is called in question by Hort in a paper appearing in the *British Medical Journal*, January 29th, 1916, p. 156.

The meningococcus has very little capacity for resistance outside the body, tending to die rapidly when dried, or even when cooled down for three or four hours in naso-pharyngeal secretions or in cerebro-spinal fluid, though retaining its vitality for several days in the latter if kept at body temperature. This lack of definite resistance means that this bacterium can be transferred only by contact with the fresh secretions of patients or carriers. It has long been known that the point of entry is *via* the nose and naso-pharynx and that the secretions from these parts are the infecting agents.

In a series of papers appearing in the *British Medical Journal*, March 20th, 1915, p. 493, and May 15th, 1915, p. 836, Lundie, Thomas, Fleming and Maclagan insist on the protean nature of the disease and define the infective processes arising from infection with the bacterium as divisable into three stages, viz., the catarrhal (naso-pharyngeal), septicæmic and meningeal stages. I am in thorough agreement with their findings as a result of recent experience in a limited outbreak among the military and civilian population of this district. Personally I have seen seventeen cases of meningitis, eight being soldiers and nine civilians, while a number of others have occurred throughout the district. In addition to these actual cases over two hundred carriers have been detected

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and isolated till germs have disappeared from naso-pharynx. All cases and every carrier showed a definite naso-pharyngitis, in the former as an initial symptom. There is nothing that is characteristic in this condition and its severity varies from a mild catarrhal condition of which the patient makes light, to a fairly severe acute pharyngitis with purulent discharge. Less than 10 per cent. of those so attacked pass on to second stage in which the bacteria spread *via* the lymph to the blood stream, the septicæmic (bacteriologically) stage, leading to more or less general systemic disturbance as evidenced by fever, headache, pains in muscles and bones and more or less prostration. With the accompanying naso-pharyngitis, this clinical condition is usually diagnosed influenza, and indeed corresponds in all respects with the usual influenza attack. In this systemic invasion there may be localization of the meningococcus in the pleura, pericardium, or joints, but the meninges of brain and cord are parts selectively attacked. A fair percentage of cases showing the septicæmic stage do not progress beyond this to stage of meningeal involvement. Yet it is only when there are cases of meningitis that the possibility suggests itself that these are instances of meningococcus infection, and such a possibility can only be corroborated by bacteriological examination. The meningeal invasion marks the third and most serious stage of the disease, but it is only then that the cases ordinarily become clinically recognizable as such. The time elapsing between development of the pharyngeal symptoms to the meningeal invasion may in some cases be run through in a few hours, while in others the period may extend to one week, the usual history being from one to four days. The symptoms presented by such invasion show considerable variation and may be discussed under different headings.

1. Headache. In my cases this has been a constant and persistent symptom and practically always of severe type. The pains are usually stated to be all over the head but most severe in the occiput.

2. Pains in neck, back and limbs are nearly always associated with headache and are more marked on attempted movement, especially is this the case on head movement. Hyperæsthesia frequently is associated, and is particularly common in children.

3. Rigidity of neck muscles, best elicited on attempting to bend head forward, is an almost constant symptom and accompanied by slight to marked retraction of the head. The marked

degrees of retraction are seen usually in children, while adults more often show only slight degrees of this condition.

4. Vomiting, too, is a fairly constant symptom. In three out of my seventeen cases I could not get any evidence of this symptom, the others suffering in varying degree.

5. Fever is a constant accompaniment and runs from 100° to 103° F. The pulse is usually rapid, rising in adults from 90 to 100 in the earlier meningeal stage, becoming more rapid as symptoms develop, though in the later stages it may slow down to 60 or lower, while before death it usually rises rapidly. Respirations show very similar range.

6. Kernig's sign as a rule is a late development but when elicited is of marked value in diagnosis.

7. An eruption appears in about two thirds of the cases and varies in character from an erythematous blush to petechial or even distinct purpuric spots.

8. The *tache cerébrale* can be demonstrated in most cases but has no special diagnostic value in epidemic meningitis.

9. The mental condition shows considerable variation. In the earlier stages patient is irritable, at times becomes delirious and even maniacal. Most cases later show depression advancing to stupor with periods of delirium, this changes to deep stupor and coma as case progresses.

Personally I would consider a case presenting a history of a catarrhal pharyngitis with fever, headache, rigidity of neck muscles and vomiting, as sufficiently suspicious to justify lumbar puncture. This simple surgical procedure, with examination of the cerebro-spinal fluid, will clear up the diagnosis, if there is actual meningeal involvement Properly done with usual aseptic precautions, it is harmless in any case and should be employed much more freely than it is by medical practitioners. It is quite true that by following this rule, an occasional case is found where the symptoms have been produced by toxin action rather than by bacterial infection; a meningismus not a meningitis.

In any acute form of meningitis the fluid will be turbid, varying from a faint milky to distinctly purulent fluid. In tubercular meningitis of course, one gets a clear fluid but this shows a definite globulin increase on chemical examination while lymphocytes are increased and a delicate cobweb coagulum develops in the fluid on standing. In acute meningitis from other causes there is always definite albumin and globulin increase and polymorphonuclear leucocytes are present, while microscopic examination after staining

of smears will usually reveal the causal organism. Apart from those forms of meningitis secondary to middle ear disease or other infective process about skull, the pneumococcus and the influenza bacillus may be causes of an acute meningitis. Clinically, however, in the absence of definite middle ear disease or other infective lesions about skull, if I found turbid cerebro-spinal fluid, I would treat the case as one of possible meningococcus infection pending microscopical and bacteriological examination. Such treatment will do no injury even if infection proves to be other than meningococcal, while if of this type much time is often saved, especially if fluid has to be sent some distance for examination.

While direct microscopical examination often reveals the causal organism, this is not always the case. Very careful search of fluids obtained from two of my cases did not show any meningococci but these developed on culture. Such findings are not uncommon in fluids obtained early in the meningeal invasion while later usually no difficulty is noted in their detection. Nor are the meningococci always intracellular. In a case of an infant of ten months, examination of the fresh cerebro-spinal fluid revealed very large numbers of extra-cellular diplococci, none intracellular. On incubating this fluid over night, the polymorphonuclear cells were found to have taken up these diplococci so that practically all were intracellular while culture gave typical meningococci. Owing to the fact that meningococci die readily, it is very important for physicians to remember that cerebro-spinal fluid (or cultures therefrom) should be kept at body heat till cultures are made and placed in incubator. It is only by attention in this respect that cultures can be assured. Various bacteriologists use different culture media for culturing the meningococci such as blood-agar, ascitic fluid agar, modified egg media and blood serum. Personally I have had excellent success in isolating meningococci on modified Loeffler's serum, using beef blood serum containing numerous disintegrated red blood cells making when coagulated a black medium on which the colonies are readily seen and recognized.

Bacteriological and especially serological tests have proven positively that there are several different strains of meningococci. These differ particularly in their serological relationships so that a serum active against one strain may be very slightly active or actually inert against another strain. In consequence serums used in treatment should always be polyvalent in character and preferably made by using for immunization of the serum producing animals the strains of meningococci active in producing the disease in the province or locality infected.

Treatment

As soon as diagnosis is confirmed by lumbar puncture, serum treatment should be instituted, using a polyvalent serum. As much fluid as will run away freely should be allowed to drain out through puncture needle, the amount varying from 30 to 60 c.c. in adults and then by gravity a smaller amount of the serum should be allowed to flow in, from 20 to 30 c.c. being sufficient for first treatment. At once, too, 5 to 10 c.c. of the serum should be injected intravenously and about 10 c.c. intramuscularly. The intraspinous and intramuscular injections are repeated in twelve hours and then every twenty-four hours till fever falls and symptoms abate. This method differs from common practice in using the intravenous route at first treatments with depôts in muscle to continue feeding of serum into blood. This is the logical outcome of our knowledge that the mode of extension is *via* the blood stream to the meninges and in consequence the meningococci in the blood and other foci of lodgment in tissues must be attacked. I have treated my last fifteen cases in this way and all but one have recovered. Three other cases (soldiers) in this military division, similarly treated, have also made excellent recoveries. Further, eleven of my fifteen cases so treated became afebrile and systemic and cerebral symptoms disappeared in from two to four days after institution of treatment. Two of the fifteen cases despite this treatment ran a prolonged febrile course of eighteen days, while one remained febrile for ten days. The meningococci isolated from the two cases running prolonged febrile course show some cultural differences from those found in other cases and I believe are a different strain against which the serum employed (that furnished by the Provincial Board of Health) was not very active. This question is now under investigation.

All the adult cases were given urotropin (formin) in ten grain doses every three hours for two or three days, dropping to half this quantity for a similar period. I cannot state that such treatment has had any definite curative results. In one case the urine became blood tinged and the remedy was discontinued. As meningococci are excreted at times in the urine, the use of formin can be advocated on this ground. Other treatment is purely expectant. The bowels should be kept open by use of salines and patients should be well nourished.

Two of my cases died. The first of these, a soldier, died within twenty-four hours after admission. This man had been ill

two days but his chums had freely supplied him with liquor and he came down with his squad when transferred to Kingston. Considering him to be deeply under the influence of liquor, he was placed in detention on his arrival but on examination several hours later by a physician it was evident that he was ill and he was sent into hospital where he arrived deeply unconscious, with temperature 102° F., and heavy breathing and a spotted rash over trunk. Lumbar puncture was performed and diagnosis of meningitis confirmed. This man got intraspinous but not intravenous serum injections.

The second case, also a soldier, did not come under my observation till ninth day of illness when I found him in condition of marked stupor with temperature $102\frac{1}{5}^{\circ}$ F., pulse 104, respiration 44. On attempting to move head forward, he cried out. Marked systolic murmur over apex, urine involuntary. Serum treatment gave no amelioration of his symptoms and he died on the eleventh day, two days after treatment was instituted.

Of the fifteen cases which recovered only one had complications, but these were of serious character. A baby of seventeen months whose case ran a prolonged course responding poorly to treatment, developed a purulent irido-cyclitis on second day in both eyes, which led to loss of sight in both. I have seen this child recently and except for eye condition, she appears to have made a complete recovery.

What must be done to check the spread? As there are at least twenty times as many persons infected with meningococcus as develop meningeal symptoms, one finds almost invariably that about an actual case of meningitis there is a circle of carriers, and this circle becomes wider if an attempt is not made to control these carriers. Pending a bacteriological examination all contacts should be isolated. My findings confirm the observations of Lundie, Thomas, and Fleming that all carriers have some grade of naso-pharyngeal catarrh though this may not be of sufficient grade to be noted by carrier, though readily recognized on examination. Thus when a case occurs in a battalion, not only should all those who sleep in the room with infected individual, but all men in the company with coughs and colds should be sent for bacteriological examination. Further, of those released after first examination, any who develop any nasal or pharyngeal catarrh within the next week, whould be at once sent for reëxamination.

As a result of observations made in examination of possible contacts, I have come to lay greater stress on the direct micro-

scopic examination of smears made from naso-pharynx than upon the examination of cultures, especially in making the preliminary "weeding out of possible carriers". Swabs are taken by use of the bent naso-pharyngeal tube designed by Mr. West, of St. Bartholomew's Hospital, and smears are at once made on slides, dried and stained by Gram's method, counterstaining with pyronin. Any case showing pus with Gram negative diplococci either intra or extracellular are held as suspects. These cases are reëxamined on second day thereafter both by smear and culture methods. Any cases showing Gram negative intracellular diplococci in pus cells are held, while cultures are examined of the cases showing Gram negative cocci extracellular for possible meningococci. Our experience, however, would go to show that when two findings, three days apart, are reported of absence of Gram negative intracellular diplococci in smears, those cases may safely be discharged from isolation. Nasal sprays and gargles of permanganate of potash 1 in 1000 to 2000, or of diluted Dobell's solution, can be used by men in isolation, though I cannot say that these or stronger solutions hasten the disappearance of the organism. Most of our cases cleared inside of ten days, but a few cases showed persistence of the organism up to six weeks.

We advocated the use of meningococcus vaccines as a preventive measure, but only about fifty took advantage of the procedure. None so vaccinated took the disease but of course the number was entirely too small to draw the slightest conclusion. Only one soldier was detected as a carrier and ordered to be isolated who later developed the disease. This man was examined on the day before he became sick and two days before meningeal symptoms manifested themselves. A provisional diagnosis of meningitis was made on his taking sick but he was not referred to me till definite meningeal symptoms had appeared.

Period of Incubation

In six of my cases the history of exposure is fairly definite and gives me some data as to period of incubation. In one case the incubation period can be fixed between seven and nine days, in another as not more than eight days, in a third as between ten and eleven days, in a fourth as not more than eleven days, in a fifth as not more than thirteen days, while the sixth case (a nurse) the period is definitely fixed as thirteen days.

Summary

1. My observations on these cases and on carriers lead me to approve of the conclusions of Lundie, Thomas, Fleming, and Maclagan that meningococcal infection passes through three stages, viz., catarrhal, bacteriæmic and meningeal.

2. Clinically except in times of epidemic it is impossible to recognize first two stages. A bacteriological diagnosis would be required in the absence of known cases of meningitis as no suspicion would arise as to nature of such infections.

3. Not more than five per cent. of those infected with the meningococcus pass to third or meningeal stage so that about every actual case of meningitis there is a circle of carriers.

4. Control of this disease depends entirely on detention and isolation of the mild cases (the carriers), most of whom in the catarrhal stage are not definitely ill.

5. Detention depends on bacteriological examination of nasopharyngeal swabs and in my experience direct microscopic examination of smears gives results at least equal in efficiency to cultural methods; can be carried out much more rapidly and at a distance from a laboratory.

6. Lumbar puncture and examination of the fluid withdrawn is essential to establish case as positively one of epidemic meningitis, though in absence of definite local causes as middle ear disease, every case showing a turbid fluid should be considered and treated as an epidemic case pending results of such examination.

7. As the disease is a systemic as well as meningeal infection, specific treatment by injection of a good polyvalent serum, intraspinously, intravenously and intramuscularly is indicated once diagnosis is made. The intraspinous and intramuscular injections should be repeated in twelve hours, then every twenty-four hours till fever falls and cerebral and general symptoms abate.

SUMMARY OF CASE REPORTS

Case I. Sergeant C——, aged twenty-four years. Reported ill February 2nd, 1916, with cold in head, pains in back and limbs, temperature 101° F. Sent into hospital next morning with diagnosis influenza and showed on admission temperature of 100 4-5° F. and complaining of headache, stiffness of neck and back muscles with pain on movement. He vomited several times during day and was delirious at times, with dazed stupor in between. First seen by me on afternoon of February 4th, when patient was unconscious, head retracted and rigid, Kernig's sign positive, petechial rash over body. Lumbar puncture gave a turbid purulent fluid with abundant polymorphonuclear leucocytes and meningococci in smear and on culture. 35 c.c. spinal fluid withdrawn and 20 c.c. Squibb's antimeningitis serum introduced intraspinous; two doses

at twelve hour intervals given on 5th of 15 c.c. and two on 6th, one on 7th, 8th, 9th, 10th, 13th, and 16th. Patient became afebrile on February 18th, the febrile stage thus lasting sixteen days. Recovery complete without complications.

This man, seven days before admission to hospital, was at funeral of his brother who undoubtedly died of meningitis.

Case II. Private S——, aged seventeen years. On February 2nd complained to chums of feeling sick, with headache and sore throat. Took whiskey and was placed in detention night of 2nd and all day 3rd, as drunk. During this period he vomited several times. Came with his squad to Kingston, February 4th, and got fresh supply of whiskey en route, and being noisy and not able to walk without support was again placed in detention room on arrival. Visited by Medical Officer late same evening who pronounced him seriously ill and sent him to hospital. Seen by me in morning when he was deeply unconscious, head rigid and retracted, temperature 102° F., pupils widely dilated, an erythematous rash with some petechial spots over trunk. Lumbar puncture gave a markedly purulent fluid under great pressure; 60 c.c. withdrawn and 40 c.c. Squibb's serum introduced. Had several convulsions during day. Treatment repeated in twelve hours. No response, patient dying following morning, autopsy confirming diagnosis.

Infection cannot be traced in this case.

Case III. Private C——, aged sixteen years. On February 12th reported sick with cold, pains in head, back and limbs, and was sent into hospital as case of influenza; worse during night, vomiting and becoming stuporous. Seen by me morning February 13th when he had temperature of 103° F., semi-stuporous but crying out at times and holding head, head rigid. Lumbar puncture showed a purulent fluid with meningococci in smear and on culture, 60 c.c. spinal fluid withdrawn and 40 c.c. Ontario Board of Health serum injected intraspinous, 10 c.c. each intravenous and intramuscular. Same evening 15 c.c. intraspinous and 10 c.c intramuscular and this dose repeated on 14th and 15th February. Afebrile on fifth day. Recovery complete. This man in same barrack room with men who accompanied Case II. on night February 4th, but was transferred next day to other quarters. Period of incubation not more than eight days.

Case IV. Miss H——, nurse, aged twenty-one years. Nursed Case I. night of February 3rd and was taken sick with headache and vomiting afternoon February 16th, grew worse during night. Seen by me morning February 17th, when symptoms were typical of meningitis. Lumbar puncture confirmed diagnosis. Withdrew 30 c.c. spinal fluid and gave 20 c.c. serum intraspinous, 10 c.c. intravenous and 10 c.c. intramuscular. Repeated the intraspinous and intramuscular dose same evening and on February 18th and 19th. Afebrile on third day of treatment. Recovery complete.

Period of incubation thirteen days.

Case V. Private H——, aged seventeen years. First fell ill afternoon of February 16th, with headache, sore throat, pain in neck and back and had attacks of vomiting during night. Sent into hospital morning February 17th, when I made diagnosis of meningitis, but lumbar puncture gave a clear fluid with no cell or globulin increase, no meningococci. During the next twenty-four hours the patient became more ill, symptoms of meningeal irritation grew more marked and lumbar puncture on February 18th gave a turbid fluid with meningococci on culture. Given intraspinous injection 20 c.c., intravenous 8 c.c. and intramuscular of 12 c.c. serum. Repeated same evening and next day the intraspinous and intramuscular injections. Afebrile on fourth day after admission. Recovery complete. This man had slept in same room as Case III. Incubation not more than ten to eleven days.

Case VI. Wilfred S——, aged seventeen years. Had to leave work afternoon February 18th on account of severe headache. He had developed a "cold" the day previous. He vomited twice during night and was so ill in morning that Dr. Sparks

was called in and diagnosed meningitis and asked me to see patient. Patient was restless and delirious, lapsing into stupor at times; neck rigid, Kernig positive. Temperature 101° F. Lumbar puncture gave a turbid purulent fluid with meningococci direct and on culture. Gave 20 c.c. serum intraspinous, 10 c.c. intravenous and 10 c.c. intramuscular. Repeated former and latter in twelve hours. Afebrile on second day. Complete recovery.

Case VII. Gunner M——, aged nineteen years. Developed a cold and sore throat on February 25th and reported ill next day toward evening. Sent into hospital February 27th as case of influenza, but during night of 27th grew worse and I saw him morning of February 28th, when case was definitely meningitis. Lumbar puncture gave a purulent fluid with meningococci. Gave 25 c.c. serum intraspinous, 10 c.c. intravenous and 10 c.c. intramuscular. Repeated former and latter in twelve hours. Afebrile on third day. Recovery complete. This man came from Toronto February 21st, so that if infected after arrival, period of incubation would be four days. Patient came down with a draft from Toronto.

Case VIII. E. G——, aged thirty-four years, insurance agent. Took sick February 17th with headache and pains in back with rigidity neck and back muscles and cold in head. Temperature 99° F. He at times was delirious and remained in this condition till admitted to hospital March 5th, i.e., seventeen days after illness began. I saw him afternoon March 5th, when he was in a stuporous state rousing at times into delirium. Temperature 99 2-5 F., neck rigid, positive Kernig. Lumbar puncture gave a slightly turbid fluid with scanty polymorphonuclears and meningococci. Gave 15 cc.. serum intraspinous, 10 c.c. intravenous and 10 c.c. intramuscular. Repeated the former and latter in forty-eight hours. Patient rapidly improved after second dose and made complete recovery. Case was apparently one of posterior basic meningitis.

Case IX. Gunner N——, aged twenty-one years. On March 5th this man reported sick with headache and cold in head. Sent into hospital next morning with headache, vomiting, neck stiffness, temperature 101 1-5° F., and a positive Kernig. Lumbar puncture gave a turbid fluid with meningococci in smear and on culture. Intraspinous serum 20 c.c., intravenous 8 c.c., and intramuscular 12 c.c. Former and latter repeated next day (March 7th) and March 8th. Afebrile on fourth day. Recovery complete. Incubation period indefinite but not more than thirteen days.

Case X. Florence C——, aged seventeen years. Took sick March 7th at Yarker. Sent to Kingston Hospital March 9th, showing headache, marked general hyperæsthesia, rigidity of neck, vomiting and positive Kernig. Lumbar puncture gave a turbid purulent fluid with meningococci in smears and on culture; 40 c.c. spinal fluid withdrawn. 15 c.c. serum given intraspinous, 10 c.c. intravenous and 10 c.c. intramuscular. Former and latter dose repeated following morning. Afebrile on second day after admission. Recovery complete.

Case XI. Mrs. F——, aged twenty-eight years; lives four miles in country. Called in Dr. M—— on March 7th for vulvo-vaginal discharge which the doctor diagnosed as gonorrhœal and sent patient into hospital for treatment. She was free from temperature for first two days but on evening March 9th felt generally ill and complained of headache. Next day sicker and vomited several times while toward evening she sank into a stupor. I saw her at midnight when symptoms were clearly those of meningitis, confirmed by lumbar puncture; 20 c.c. serum given intraspinous; 8 c.c. intravenous and 12 c.c. intramuscular. Intraspinous and intramuscular injections were repeated on March 11th, 12th, 13th, 15th, 17th, 22nd, 24th, 26th. Beginning March 20th a vaccine of mixed gonococcus and meningococcus was also employed, being repeated every fourth day. The gonorrhœal infection spread to uterus and tubes causing much pain and distress. Patient became afebrile eighteen days after onset. Convalescence was slow but recovery complete. Meningococcus was readily iso-

lated from spinal fluid and naso-pharynx and the gonococcus from the vaginal discharge. Likely double infection was communicated by same individual.

Case XII. Baby H——, aged seventeen months. Took sick March 17th, with vomiting. Dr. C—— called March 18th and found child feverish, markedly hyperæsthetic, vomiting and head retracted. I saw her March 19th and did lumbar puncture getting a markedly purulent fluid. Gave 10 c.c. serum intraspinous, 2 c.c. intravenous and 8 c.c. intramuscular. Repeated former and latter in twelve hours and on second, fourth, sixth, eighth, eleventh, eighteenth, twentieth and twenty-second days of illness. On March 21st both eyes showed a purulent iridocylitis which completely destroyed sight. Otherwise child has made a good recovery.

Case XIII. Baby H——, aged ten months. Took sick April 2nd. Dr. M—— called April 3rd and diagnosed meningitis from vomiting, head retraction, fever. Lumbar puncture gave turbid fluid with meningococci. Intraspinous serum given 5 c.c., intravenous 5 c.c., and intramuscular 5 c.c. Former and latter repeated next day (April 4th) and on April 5th. Case afebrile on fourth day. Recovery complete.

Case XIV. Boy W——, aged seven years; from Tamworth. Seen by Dr. O'C—— on April 9th for a "bilious cold". He grew gradually worse and on the 13th was sent into hospital under care of Dr. Gibson who diagnosed meningitis, performed lumbar puncture, getting a turbid fluid with meningococci present. Gave serum intraspinous 15 c.c., 8 cc. intravenous, and 8 c.c. intramuscular. Repeated former and latter on April 14th. Afebrile on morning of third day after admission. Recovery complete.

Case XV. Private J. B——, aged twenty-two years. On May 4th patient developed a cold in head with some headache. On May 6th was quite sick complaining of severe headache, vomiting, temperature 102° to 104 1-5° F. During night lapsed into stupor. Next day sent to Brockville Hospital where same symptoms were prominent. Case diagnosed May 8th as meningitis. Captain Hall went down from Kingston, did lumbar puncture, getting a turbid purulent fluid showing meningococci. Gave 20 c.c. serum intraspinous, 10 c.c. intravenous and 10 c.c. intramuscular. Repeated dosage May 11th. Afebrile on fourth day after serum first used. Complete recovery.

Case XVI. H. S——, aged twenty-two years (Switzerville). Patient had slight sore throat with pains all over and some headache on June 5th. Next day worse and called in Dr. Macaulay of Newburgh on account of severe pains in back and limbs. During next three days cerebral symptoms became more marked. I saw him in consultation June 9th. Found patient with temperature 101 2-5° F., pulse 120, neck stiff and painful, head slightly retracted, Kernig positive; stuporous, but would answer when questioned. Lumbar puncture gave a turbid fluid showing meningococci. 30 c.c. serum given intraspinous and 10 c.c. intramuscular. Dr. Macaulay repeated this treatment on June 10th, 11th, 12th, 13th, 14th and 16th, seven doses in all. Recovery complete. No intravenous injection given.

Case XVII. Sergeant S——, aged forty-one years. Took sick June 12th with headache, vomiting, slight sore throat and pains all over. Sent to Military Hospital where condition was diagnosed as rheumatism and later as complicated by nephritis. I was asked to see him June 20th, the ninth day of his illness. He was unconscious but cried out when I attempted to move his head. Neck rigid, Kernig positive, temperature 102° F., pulse 104, respiration 44; marked systolic murmur at apex with diffuse cardiac impulse. Urine involuntary but catheter sample showed abundant albumin and casts. Lumbar puncture gave a purulent fluid with many meningococci. 20 c.c. serum given intraspinous, 10 c.c. intravenous and 10 c.c. intramuscular. Former and latter repeated next morning but there was no response. Death on 22nd June. Autopsy confirmed diagnosis of epidemic meningitis.

POSTURE AS AN AID TO TREATMENT

By Major S. A. Smith, C.A.M.C., D.S.O.

Granville Canadian Special Hospital, Ramsgate

WITH the very limited time at my disposal I merely wish to mention a few salient points upon what is really a large subject, and to particularize in certain types of cases which appear to be fairly common, judging from the number of instances that we have seen during the past three months. I refer to deformities of the wrist and fingers.

Cases of deformity in many instances would not have been so severe in nature nor so long under treatment if postural treatment had been instituted at the outset. It is immaterial as to whether one expects a fixed or a movable joint to be the outcome, the main idea is always to place the limb in the most advantageous position for use.

This axiom covers such a large and diverse field including septic and tuberculous disease of joints, amputation, injuries to nerves, bones, ligaments and muscles. This is doubly true since we are now seeing the results of continued suppuration to a much greater extent than we ever did in peace time and we have thus to combat the vicious contracture of scar tissue.

In a short communication of this nature I cannot enter the large subject of the prognosis of joint injuries as to whether mobility or fixation is to be the result. I can, however, state that with injuries round joints due to wounds it is by far the safer plan to adopt (if one is uncertain) a safe policy of suitable posture and fixation rather than an enthusiastic and heroic campaign of continued joint movements and aim for an ankylosis in a suitable position.

I may add that after gunshot wounds, even where the joint has apparently escaped, the degree of latent infectivity is such that after forcible movements the tissues react in a more alarming way than we have been accustomed to experience. Speaking

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generally then we assist the weaker group of muscles by such postural fixation as will prevent their action being overcome by their stronger opponents, and where there is the formation of scar tissue this must be constantly kept on the stretch by rotation to prevent its contracture.

To particularize—in suppuration from gunshot wounds it is necessary to keep the knee extended—the foot at right angle with the leg—the wrist hyperextended—the elbow flexed to 100 degrees and the shoulder slightly abducted. To show how this work is being overlooked I may mention that I have in the past month divided the tendo Achillis in six instances for septic wounds in the calf of the leg where the case was nursed without regard to the future deformity. I have removed the scar in one case and forcibly stretched it in two others in popliteal wounds where the leg was allowed to flex at the knee. The patients were all apparently allowed to walk with crutches on their sound leg, the injured leg being tucked up out of the way. In all these cases it was necessary to tenotomise the Achilles.

I have had to re-amputate in two cases owing to lack of postural treatment—both were seat of election amputations—one having a very short tibial stump. There was so much contracture at the knee that extension beyond a right angle was impossible. Wrenching and even full division of the posterior ligament of the knee joint was unavailing so I was forced to do a Critti-Stokes.

Contracture of the psoas in amputations through the thigh is the rule rather than the exception owing to the use of stump pillows in cases that suppurate. Means of avoiding these results are so obvious that it is unnecessary to say more.

I intend to particularize in conditions of the hand and forearm and to show the types of apparatus that are in use here for the prevention and cure of deformity.

I might divide the cases into, (a) paralysis, (b) contracture, although obviously (b) may complicate (a).

Section A. *Paralysis.* Let us take musculo-spiral paralysis, for example, in the first class, due to bullet shell fragment, callus overgrowth, the sharp edge of bone in a spiral fracture piercing the nerve, in axilla method of shoulder reduction—we have examples of them all. Here the long cock up splint is applied, made of 22 gauge malleable iron and strengthened by the grooves punched longitudinally. This splint is constantly worn and even when temporarily removed the wrist and fingers are not allowed to flex, the patient nursing the hand as shown. This is to relax the paralyzed group

of muscles which are without tone and it prevents contracture of the flexors. Where the nerve is divided, posture is an aid to surgical interference; on the other hand the nerve may have been temporarily put out of action by pressure or traction. Here posture is an aid to massage and electrical treatment and by relaxing the muscles involved prevents their overstretching and gives the best chance of recovery. We know that overstretched muscles fail to react even after nerve conduction is restored, a fact well known in poliomyelitis.

As a rule the extensors of the fingers recover before the primary wrist extensors. When the fingers can be extended from the metacarpo-phalangeal joints the long splint may be changed for a short "cock up". For median nerve involvement the long "cock up" can be reversed and placed on the dorsal instead of the palmar surface of the hand and wrist to keep the wrist and fingers flexed.

Section B. *Contracture.* In old standing wounds of the forearm where there has been prolonged suppuration the cases as a rule came with contractures of the flexor and pronator groups, with stiffened fingers in semi-flexion at the metacarpo-phalangeal and interphalangeal joints—flexion of the wrist and marked pronation.

After what I have said about overaction of the stronger group one asks why is there pronation? This, I take it, is the result of prolonged use of a sling with the arm pronated and the hand dangling.

In this type of case the wrist and fingers are forcibly hyperextended, under an anæsthetic if necessary, and a long "cock up" applied—the arm is forcibly supinated and kept so in extension by means of a fracture splint twisted on the bias.

These splints remain in position for about ten days or until such a time as the contractures are overcome: the fracture splint is removed, and it is found that the hands can be voluntarily supinated and that the "kick" of the contracture has disappeared. The short "cock up" is substituted for the long one and the patient is massaged and has daily stretchings; after a little while all splints are removed and the men go to the gymnasium for active exercises of the muscles involved.

I may add that in the beginning some men have such shortened flexors of the fingers (communis and sublimis) that finger splints must be applied before it is possible to extend the wrist.

Where the fingers are extended and fixed due to adhesions

the glove and bracelet is worn. This is used not only in cases where stretching or fixation is required but is more generally useful in the common type of case where there has been damage to the flexor tendons and where flexion of the fingers is impossible on account of the weakness.

Here the aim is to produce relaxation for a considerable time —generally two to three weeks. When the tendon is relaxed it undergoes shortening, the taking in of its "slack" as it is termed by Robert Jones. The result is the restoration of synergic balance and function is improved. After the fingers can be voluntarily flexed the glove is removed and massage is persisted in, at the same time progressive exercises are instituted and the same good results are obtained.

A REPORT of the first six months' work in the orthopædic department of the Woodside Red Cross General Hospital at Glasgow has been published. During this time 217 soldiers received treatment. The cases included wounds, contusions, fractures, dislocations, sprains, synovitis, arthritis, periostitis, rheumatism, myalgia, lumbago, neuritis and other nervous affections. The majority of the soldiers recovered sufficiently to return to their units. About 10 per cent. were discharged as unfit for active service, but all retained the use of their limbs.

THE Australian Government has decided to subsidize on a £ for £ basis any work undertaken by the states of the Commonwealth to prevent the spread of venereal diseases, and a sum of £15,000 has been set aside for this purpose. The states will be required to furnish evidence that the work has been efficiently planned and will be properly carried out, and to provide facilities for educating medical students in modern methods of research and clinical investigation.

SYPHILIS: ITS CAUSE AND TREATMENT

By J. E. R. McDonagh, F.R.C.S.

Surgeon to Out-Patients, London Lock Hospital.

AS you are all aware the first lesion in syphilis goes by the name of the primary sore. According to text-books a primary sore is recognized by three cardinal points: (1) that it is indurated; (2) that it is single; (3) that it is accompanied by hard and shotty glands in the groin. There is only one way to diagnose a primary sore, and that is by looking at it. Induration in many sores never occurs. It is always a sign of healing, therefore a late sign, consequently if we hope to diagnose syphilis earlier to-day than our forefathers did, we must not wait for induration to appear before making up our minds. In over 30 per cent. of cases of syphilis there is more than one primary lesion, and in the soft sore infection, that is to say the sore caused by Ducrey's bacillus, to find a single lesion is not at all uncommon. In 95 per cent. of cases of gonorrhœa the inguinal glands are enlarged. In 5 per cent. of cases of syphilis the inguinal glands undergo no change, and in a very great number of cases of syphilis the glands are enlarged and soft, being by no means always hard and shotty.

The patient should never be asked how soon after connexion the sore appeared, since in the majority of cases the information vouchsafed is untrustworthy and the incubation period of a soft sore of the type "*ulcus molle elevatum*"—the type of soft sore in which the lesion is often single, may be six weeks or more.

Remember that the organism of syphilis is a protozoon, an organism which is not combatted by polymorphonuclear leucocytes, therefore an organism which is neither pus-producing nor destruction-causing. A chancre is typically an erosion, not an ulcer, therefore its surface is smooth, often shiny, and either flush with the surrounding skin or raised above it. The erosion is circular, perfectly circumscribed and as it gets bigger it increases in its entirety, not in part only as is the rule with a soft sore. Owing to this unipolar spreading of a soft sore, the outline becomes irregular and as

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the streptobacillus is a pus-producing organism, and as pus cells have a strong proteolytic action the soft sore is an ulcer, its edges are undermined and the base is rough—somewhat like a ploughed field. A soft sore is generally surrounded by an inflammatory area, which is not the rule with a syphilitic sore. If a chancre becomes an ulcer, it usually means that it has become secondarily infected, and if gangrenous, then the secondary infection is almost invariably due to the symbiotic unevenly-coiled spirochæta and the fusiform bacillus—the same organisms which cause "Vincent's angina" and "*Balanitis erosiva et gangrenosa,*" and many of the cases of pyorrhœa alveolaris as your pathologist, Captain Bowman, has demonstrated.

If a primary sore becomes secondarily infected or gangrenous it may have an influence upon the future course of the disease. If the secondary infection commences before the organisms have swept into the blood stream, the patient may never exhibit another symptom of syphilis, because a secondary infection usually kills the syphilitic organisms, in the same way as an acute local streptococcal or staphylococcal infection may kill gonococci. It is for this reason that a soft sore is so seldom followed by a syphilitic infection. It is frequently said that a soft sore may become a chancre—Well! I doubt whether I have seen two cases in my experience. The explanation is that the sore was always a syphilitic one and that the observer was wrong in his initial diagnosis. In other cases the superaddition of a secondary infection very often results in the inguinal glands not becoming enlarged and in the symptoms of the generalization stage being delayed. I have seen cases in which the generalized rash did not appear for nine, twelve, or eighteen months after the sore had vanished. In these cases the rash is often a very severe one. On the other hand a gangrenous primary sore may be the commencement of malignant syphilis. The organisms leave the sore and reach the inguinal lymphatic glands *via* the lymphatics, which can often be felt as a solid or knotted cord in the dorsum of the penis. If a section be made through this cord and examined under the microscope, a picture is seen, as if the section had been made through part of a lymphatic gland. Protozoa are attacked by resisting substances, some of which circulate in the serum and act generally, others act locally in the form of plasma cells. Plasma cells and the general resisting substance arise from lymphocytes and these in turn from endothelial cells; therefore the organisms can always be attacked locally since endothelial cells are everywhere. The reason why induration is common in

chancres and why the lymphatic cord and the inguinal glands are hard, is because the spore of the "*Leucocytozoon syphilidis*," the cause of syphilis, lives at the expense of either endothelial or connective tissue cells, and the latter form fibrous tissue. The hardness just referred to is only characteristic of early syphilitic lesions, for the reason that when the host has just become infected, his main protective capacity has not been called forward and the organisms are—vulgarly speaking—having it all their own way. When the organisms become generalized which they do by way of the lymphatics and then by the blood stream, the resisting power of the host is in full swing, numerous plasma cells become manufactured locally, the organisms are vanquished, hence the connective tissue cells are not so readily attacked, with the result that not so much fibrous tissue is formed, therefore there is no induration. If the host is sterilized at this early stage by the powerful remedies we have at hand, should some of the spores escape annihilation and develop again, the host will forget that he has had to form protective substances against these organisms before, with the result that the early lesions of the recrudescence will simulate those of a fresh infection. Most of the cases of so-called re-infection occur in the way described and are truly cases of recurrent syphilis.

The syphilitic organisms reach the skin and, for all that, every organ in the body, by the blood stream. To make a description of the cutaneous lesions clear, imagine the skin to be divided up into circular areas, each area being about the size of a shilling. Picture the shilling as a wheel. The axle is the central artery, the spokes are the branches of this artery, and the rim is the vein. You can all prove this by undressing a man in a cold room when you notice congested, or dark coloured, circles appear—a condition which is known as *livido*. These congested circles are the rims of the wheels. The organisms travel to the surface by the central artery, the moment they reach the surface they naturally act as foreign bodies, with the result that dilatation of the small vessels occurs and there is a richer blood supply to the part—phenomena which we call erythema. The name given to this erythema in syphilis is roseola. As the erythema becomes more localized and limited to the circles we call it a macule. The organisms now develop and form a papule. A papule may either retrogress, in which case a scale forms in its centre, or it may form a pustule or even an ulcer. The change a papule undergoes depends upon the amount of damage caused to the central artery. If obliterated, then the area supplied by it will degenerate and an ulcer is formed. This is the pathology

of a gumma, if the ulceration is a recurrent syphilide. As time goes on the organisms spread peripherally and radially from the central artery, with the result that when they produce fresh lesions the lesions will be in the form of circles or segments of a circle. If these few points be borne in mind, namely, that all early lesions develop in the centre, and all recurrent lesions develop either in the centre, along the radii, or in the circumference of the circle, and that the organism has many stages to go through before the ripe phases are formed, which accounts for the polymorphism of the early cutaneous eruption, none of you should have any difficulty in diagnosing a syphilitic skin lesion. You are all familiar with the rapidity with which the early syphilitic lesions vanish and the ease with which the system can be sterilized with the powerful anti-syphilitic remedies we are now employing, but an important issue arises out of this, which has generally been overlooked.

As soon as the organisms have reached the skin the meninges have become likewise involved. Now remedies applied per os, intramuscularly or intravenously, do not reach the meninges so readily or efficiently as they do the skin, and as the protective substances circulating in the serum are required also by the meninges, it will be readily understood that you may sterilize the system, without sterilizing the nervous parts of the body. If the former is sterilized and not the latter the nervous parts will lack the chief pillar of protection, with the result that the organisms in the meninges will flourish to their heart's content. This is the reason why we see so many more cases of meningeal or cerebro-spinal syphilis than we used to. In the ordinary course of events the organisms spread from the meninges into the nervous tissue proper, and produce either degenerative or non-degenerative encephalitis and myelitis. The reason why most degenerative lesions of the cord are posterior is due, I think, to the spread of the organisms along the septic posticum—anteriorly no such ligament exists. The same explanation may also be applied to degenerative encephalitis being a cortical lesion. The spores probably spread along small arterial branches in the walls of which they develop male and female phases. The adult male is the Spirochæta pallida and being motile it gets beyond the confines of the vessel to live at the expense of the nerve cells, which of course results in the degeneration of the latter. Owing to the poor blood supply of nerve tissue these extra-neurally situated organisms are difficult to get at, hence the reason why our treatment is, generally speaking, unavailing in cases of so-called tabes and general paralysis of the insane.

I cannot go deeper into the clinical aspects of syphilis as I have to mention other points in the short time at my disposal, which I know you are anxious to hear about. I will therefore turn my attention first to the cause of syphilis.

Most of you probably still believe that the cause of syphilis is the *Spirochæta pallida;* if so, how are you going to explain the long incubation period of syphilis, the fact that re-occurrences occur in spite of several injections of "606" when the first kills every spirochæta in the body, and how the spirochæta develops. I spent most of 1911 and 1912 in working out this problem and I am now convinced that the cause of syphilis is a spore which has a typical coccidal life history in the development of which male and female bodies are formed. The name I have given to this coccidal protozoon is the *Leucocytozoon syphilidis,* the adult male phase of which is the *Spirochæta pallida.* The acceptance of this life cycle explains all the enigmas of syphilis, none of which were dispersed by the discovery of the *Spirochæta pallida.* The different phases can be readily recognized in every syphilitic section and I have placed some under the microscope for you to see afterwards.

I will now say a few words about the Wassermann reaction.

The Wassermann reaction is a purely empirical and non-specific reaction, in spite of which it is generally maintained that a positive reaction is indicative of active syphilis. As a result of my investigations into the *modus operandi* of this reaction, I can assure you that a positive reaction only indicates that the patient has presumably had syphilis and no more.

The reaction is a physical reaction, dependent upon the increased size and number of the solid particles or protein in the serum, which form the resisting or the host's protective substance. Seeing that the call upon the resisting substance is more pronounced in protozoal diseases than in bacterial diseases, and especially in syphilis, it occurred to me that a simple test could be devised for exhibiting it. The resisting substance or the protein particles as they normally occur in the seru n are in solution, owing to water their molecules contain and to salts which are attached to them. If they are deprived of both the water and salts they become precipitated, and are then visible to the naked eye. Glacial acetic acid will abstract the water and salts and the superaddition of a sulphate or nitrate will precipitate them. The best sulphates to use are the sulphates of ammonium, lanthanum or thorium, and the best nitrate is that of the last named metal. As the number of protein particles in a syphilitic serum varies from those in a normal

serum or from those in a serum from most other diseases, it will be seen that the degree of opacity or precipitation caused by the glacial acetic acid, ammonium, lanthanium or thorium sulphate, and thorium nitrate will likewise vary.

It is owing to the increased number and size of these protein particles that "606" is more efficacious in protozoal than in bacterial diseases. The arsenic does not attack the organisms directly as Ehrlich thought, it merely accelerates the normal action of the protective substance.

Speaking in simple language, so that all may understand, my view is that the protective substance destroys the parasite by robbing it of part of its oxygen. In order to do this the protective substance has both the power of oxidation and reduction. The process of oxidation is accelerated by metals; iron is the metal which fulfils this purpose in the human body. The process of reduction is accelerated by non-metals, of which sulphur is the most important one. Thence my discovery of "Ferrivine"—an iron compound, and Intramine—a sulphur compound. Ehrlich's work on chemotherapy, brilliant as it was, was purely empirical and he had no sound *à priori* reason for choosing arsenic—shown by the fact that just before he died he added copper and sodium to salvarsan.

As a matter of fact, arsenic, copper and sodium are probably three of the least desirable elements which Ehrlich could have chosen.

The toxicity of a metal is largely influenced by its atomic weight, and this is one of the reasons why arsenic is more toxic than iron, and it also explains why organic preparations of mercury are so toxic.

Mercury acts as an anti-syphilitic agent in virtue of its high atomic weight, and it is highly probable that it could be replaced by metals of a higher atomic weight still. Iodine acts as a reducing agent and therefore simulates the action of sulphur.

In all these organic preparations of metals it is always difficult to ensure that the compound will join on to the protective substance before some of the metal becomes free. Before explaining what happens should the above be the case, I must remind you that the serum is alkaline. The degree of alkalinity is fixed and it is known as the normal hydrogen ion concentration. The normal hydrogen ion concentration is nothing more nor less than a balance between the hydrogen (H) and hydroxyl (OH^1) ions in which the latter slightly prevail. In other words the serum is alkaline because it contains a slight excess of hydroxyl or negatively charged ions.

As metals are positively charged, if any are free when we inject them intravenously, they immediately combine with the hydroxyl ions and thus raise the hydrogen ion in concentration. Clinically the symptoms which follow an upset of the hydrogen ion concentration fall into two groups—(1) the cardiac, (2) the pulmonary. In the cardiac attack the patient faints, the pulse becomes weak, occasionally imperceptible, and the patient may die.

In the pulmonary attack the patient experiences a difficulty of breathing, the tongue and lips become dry and œdematous, the voice fails and the patient thinks he is going to die, but he practically always recovers. The degree of the attack is influenced by the valency and the atomic weight of the element; therefore shock is more serious when arsenic than when iron is the metal used. Many of you have doubtless experienced mild or severe attacks of shock following intravenous injections of the arsenical compounds. Owing to the readiness with which the iron becomes free when ferrivine is administered intravenously it is not at all uncommon to witness mild attacks of shock. I am striving hard at the present time to overcome this disadvantage, since ferrivine produces no toxic symptoms such as dermatitis, neuritis, etc., which are too apt to follow in the train of the arsenical compounds, and its anti-syphilitic action, if used in sufficient doses, is as good and in some cases even better than "salvarsan".

With intramuscular injections, shock does not occur, therefore the disadvantage above referred to is not met with in intramine. Intramine is non-toxic and being complementary to the metallic compounds, its use is indicated in every case of syphilis. At present intramine has the drawback of being painful, but this is a difficulty which I am now overcoming. With the facts now before us, I will end my paper by briefly describing the treatment of syphilis.

If a patient comes for treatment with a primary sore only, after treating the sore locally by excision or by applications of Ung. Hydrarg., or Lotio Nigra, he should receive two intravenous injections of a metallic compound with forty-eight to seventy-two hours interval between them. Five days later he should have an intramuscular injection of intramine and one week after the intramine another intravenous injection of a metallic compound should be administered. The combination of Ferrivine and Intramine in the primary stage acts in a most wonderful way in getting rid of induration, the hard lymphangitis and lymphadenitis. Neither "salvarsan" nor mercury have much effect upon induration. I feel it is imperative to relieve the sore of its hardness at the earliest

possible moment, since induration prevents the drugs from reaching the site in sufficient quantity, with the result that when the host is sterilized, he may get an auto-re-infection. Note how commonly the site of a chancre breaks down again, and the frequency with which recurrent papules and gummata occur thereon.

Immediately after the course of treatment just mentioned has been given mercury and iodides should be prescribed for a year. Mercury can be given internally, when its administration should be continuous or better in the form of intramuscular injections. I am accustomed to inject grey oil intramuscularly once a week for eight weeks, then to order iodides internally for three weeks and then rest from the treatment for five weeks. In a case of primary syphilis three courses would thus be administered in the year.

The following is the prescription of the "Grey Oil" I use:

℞ Hydrarg.....20 parts.
Anhydrous lanoline.....30 "
Chlorbutol..... 2 "
all a.a. by weight.
Liq. paraffin. .....to 100 parts by measure.
5 mins. contains gr. i. of mercury. Inject 5 to 15 mins. weekly.

The bulk of this grey oil is small, it is liquid at room temperature, and as much as 30 grs. of mercury can be given at a dose, and it is painless.

If the patient has entered the generalisation stage I prescribe two intravenous injections of a metallic compound both before and after one or two intramuscular injections of "intramine" and six courses of the combined mercury and iodide treatment, or mercury internally continuously for two years.

For a case of ordinary recurrent syphilis I first of all prescribe one or two intramuscular injections of "intramine", then one or two intravenous injections of a metallic compound, allowing a week to intervene between each injection. This is followed up with mercury and iodides for six months.

If a patient has had syphilis and has been well treated, and he comes up for advice because he believes that a blood test will tell him whether he is cured or not, I make a thorough clinical examination and if I find no symptoms, or signs of active syphilis, I neither test his blood nor prescribe treatment, not even if his blood has been alreaady tested and has given a positive reaction. A positive reaction in latent syphilis is often a sign of protection, because I

have seen the onset of a degenerative central nervous lesion accelerated by the breaking down of this protective pillar as I have called it earlier in my paper. I feel very strongly that all cases of latent syphilis should be left alone and that all cases of recurrent syphilis should be treated symptomatically only. A case of pure meningeal syphilis should be treated as a case of recurrent syphilis, and it is a good plan to give an intraspinal injection of the prepared serum drawn off on the third day after each intramuscular and intravenous injection. In a case of active degenerative myelitis, the question as to whether the case is active or not can soon be proved by an examination of the cerebro-spinal fluid. So many intramuscular injections of "intramine" and intravenous injections of "ferrivine" plus an intraspinal injection of the prepared serum after each, should be administered until the cerebro-spinal fluid is approximately normal. The new arsenical preparations, such as "galyl," "kharsivan," etc., should never be employed for the preparation of serum for intraspinal use, as they are too toxic. A case of active degenerative encephalitis should be treated by "intramine", and a metallic compound alternately, but I do not think there is any advantage in injecting serum intraspinally. I have had some extraordinary results by combining "intramine" and a metallic compound in the treatment of so-called G.P.I.

I hope I have not kept you too long listening to this paper, and I trust you will now enter freely into a discussion upon it. When the discussion is over I shall be pleased to show you the various specimens, plates, etc., I have brought with me.

Case Reports

APPENDICO-VESICAL FISTULA

By M. Lauterman, M.D.

Montreal

PATIENT a male, aged twenty-six, chauffeur, came under observation September 17th, 1911, complaining of urethral discharge, painful, frequent and difficult micturition.

Illness began three weeks ago with dull persistent pain in suprapubic area, radiating towards rectum and into perineum, accompanied by frequent desire to micturate (about every hour when moving about, every two to four hours when sitting quiet or lying down, with once during the night). During the last week has not experienced relief after voiding, having developed what he describes as a burning, aching feeling in bladder and urethra; this, however, passes off in from fifteen to twenty minutes. Patient's habits may be said to be good, though he smokes ten to twenty cigarettes a day, uses beer moderately, sometimes none for weeks, never exceed-two or three bottles of lager on any one day; no gonorrhœa or lues. Lived in the United States until five years ago; always enjoyed good health, trained carefully in bicycle riding; measles at seven, no other illness. During last three years has suffered from constipation, due to sedentary occupation, sometimes three or four days without bowel movement. Castor oil or pil. cath. co. have been taken for relief. July 4th, following an unusually obstinate attack of constipation obliged to take to bed for ten days, during which time he suffered from severe abdominal pain, vomiting and fever. Physician diagnosed at different times, gall stones, renal colic, gastric ulcer. Morphine was the only thing which gave relief and enemata and hot fomentations completed treatment. Three weeks from time of onset of illness returned to work though not well, right side felt lame. During first week of September after a long drive over rough roads, bladder not being emptied for five hours, on commencing the act experienced great pain in right side of abdomen,

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felt faint for a few minutes, voided about a pint of cloudy urine, mixed with blood and some slimy material. An hour later again had desire to urinate but this time passed a considerable quantity of gas having a fæcal odour. Consulted his physician who said he probably had taken cold in his bladder and would be all right in a few days. The patient not being satisfied consulted a druggist. At this period he was voiding six to ten times in the twenty-four hours, from two to four ounces each time of cloudy offensive urine, the last part of which was always thick and contained a mucilaginous substance which hung from the meatus until forcibly expressed; on several occasions particles of brownish, or greenish-brown material, irregular in form, size and consistency were intimately mixed with the discharge. Air now bubbled from urethra each time he voided urine and each time bowels moved. During last week or ten days he suffered from diarrhœa, especially in the morning. This continued until he came under my notice September 17th, when on returning from Plattsburg at 6 p.m., on leaving his car to urinate he felt a sudden sharp pain in the perineum along urethra to glans penis. Felt desire to strain which caused urine to dribble slowly from urethra, but pain so severe that some friends had to come to his assistance. He was brought to my office at about 7 p.m., was pale, cold, bathed in perspiration with small rapid pulse, presenting all signs of a man suffering from severe shock. The ready-made diagnosis of stricture offered by the patient, which had been furnished by the druggist who had prescribed a mixture for its relief, as well as the history of pain radiating down the side, suggested a rectal examination. The prostate was slightly but uniformly enlarged, sensitive, seminal vesicles apparently normal, bladder fluctuating just above and behind prostate. In front of prostate in the membranous urethra, between layers of the triangular ligament, where one looks for an infected bulbo-urethral or Cowper's gland, one felt a small lump about the size of a large pea, sensitive on pressure—here one evidently had the stricture, or as I thought, an impacted calculus. I washed the anterior urethra with warm boracic by means of a hand syringe and tried to pass a No. 20 F soft rubber Wishart catheter which entered easily as far as the obstruction, about twenty cm., or eight inches, but gentle pressure failed to pass the obstruction. A Hugh Young post-urethral tube was then inserted as far as the obstruction, the obturator being removed, it was possible to examine the site as well as the cause of the obstruction. Through the urethroscope there appeared a white body with a rounded edge which caused one to think of a

calculus. It could be moved backwards by pressing the tube against it. It was seized with forceps and drawn into lumen of tube and proved to be a grain of indian corn ingested seven hours previously. The No. 20 F catheter now passed easily and twelve ounces of cloudy urine with fæcal matter were removed, bladder washed with warm boracic, solution urotropin, rest in bed, fluid diet prescribed.

September 18th: Cystoscopy, Brown Buerger indirect, with examining lens passed easily eight ounces oxycyanide of mercury solution, 1-10,000 in bladder. Mucous membrane thickened, dull and injected, several patches having a deep brownish red colour with particles of fæcal matter adherent. Both ureteral openings appeared normal. Two inches above right ureteral opening was an irregular-shaped slit with ragged edges which allowed the tip of the cystoscope to enter and its removal was followed by flow of fæcal matter which clouded the field.

Operation under ether anæsthesia. Ureter and fistula previously catheterized. Abdomen opened through right rectus. Adhesions of cæcum to peritoneum and bladder encountered and separated; tip of appendix free and pointing to patient's left side, body adherent to right side of posterior wall of bladder for about two inches. The catheter in side could be felt passing into cæcum. Appendix carefully dissected free from cæcum, tied off and cut through with cautery knife; stump inverted with a purse-string suture. Appendix now freed from adhesions to about one-quarter inch from edge of fistulous opening, peritoneal covering cut through all the way around and pedicle thus formed tied off with catgut, appendix cut through with scissors. Outer wall of bladder was now sutured over the stump and the cut edges of the peritoneum in turn sutured over the whole. Catheter left in forty-eight hours. Left hospital eleventh day after operation.

Cystoscoped four weeks after operation could see spot where opening had been, bladder mucous membrane healthy, still had colon infection of urine, treated with lactic acid bacilli and irrigation of alum acetate solution.

Pilcher, "Ileo-vesical and Appendico-vesical Fistula complicated by Stone in Bladder," *Trans. Americ. Urological Association*, 1912, vi.

Boehm and Dean, "Sigmoido-visical Fistula and Diverticulitis," *Amer. Jour. of Urology*, 1912, viii, page 474.

Cunningham, J. H., "Recto-vesical and Entero-vesical Fistulæ," *Trans. Amer. Urological Association*, 1915, ix.

CASE REPORTS FROM THE ARMY MEDICAL SERVICES

I.—BILHARZIAS

Case Presented by Captain A. Roche Robertson, C.A.M.C.

Granville Canadian Special Hospital, Ramsgate

PRIVATE J. A. J., aged twenty-eight. Complaints, on admission: nervousness and passing of blood in urine; pains in small of back. Personal history: military musician since age of fourteen, when he joined the Third Manchester Regiment. After four months at Aldershot he went to St. Helena, remaining there six months. Then he went to South Africa for four years, being stationed at Middleburg, Cape Colony, for three years, and afterwards at Middleberg, Transvaal. Came home December, (1910), and was absorbed into —— ——— Regiment, and sent to Guernsey for a month. He was then transferred to Royal Canadian Regiment at Halifax, remaining there until August, 1914, when he proceeded to ——, remaining there one year. Returned to —— and then came on to ——, September, 1915. Reached —— November 1st, then to La Clytte within sound of guns. Got into trenches as stretcher bearer at —— when he at once began to feel nervous because of gun-fire. Thought every shell was meant for him; imagination vivid; tired quickly. After sixteen days his fellows told him to go back, but he stuck out until they went into billets again. Felt very nervous that night, and in the morning when our first guns began he collapsed in sheer weakness and trembling, the right side seemingly much weaker than the left. Was sent back to field ambulance at —— and after seven days returned. But the first crash of guns made him worse than ever, though he tried hard to stick. He couldn't stand, and his commanding officer sent him down to —— hospital.

His nervousness really began two years ago when he lost his wife in child-bed. He grieved sorely over this, and in Bermuda was exceedingly nervous and weak; so much so that his comrades noticed it. When in Africa he was in the Karroo desert, and spent much time hunting. He would drink water anywhere. Some of

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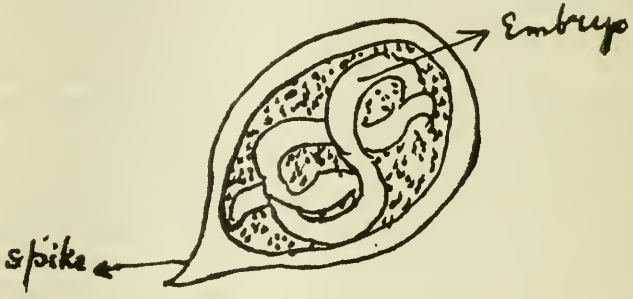
Cases presented at the Ramsgate meeting of the Medical Society of the Canadian Army Medical Corps, April 24th, 1916.

his pals there had "red water" and he also noticed that he had it there for the first time. Now he finds that there is more blood in the urine in the latter part of the afternoon. He has very little urgency or frequency. The blood generally comes towards the end of micturition. He has pains of a dull character in the lumbar region, but none in the perineum.

Present condition: heart lungs, reflexes, abdomen, etc., are normal under examination.

Urine, slightly turbid and smoky, acid, no sugar, heavy ring of albumin. Microscopically, there is much blood but no pus or casts. There are *numerous characteristic ova of Schistosomum hæmatobium* (Bilharzia) with spike on the end.



II.—SACROLIZATION OF LUMBAR VERTEBRA

Case Presented by Captain D. A. Clark, C.A.M.C.

Private V. H., Diagnosis: sacrolization of fifth lumbar vertebra with resultant nervous and static manifestation. Complaint: grinding pains in left hip on walking or sitting, with shooting pains in left calf and gradually increasing lameness. Duration: one year.

Present condition: complains of a sharp grinding pain in left hip and shooting pains in left calf radiating to foot. The pains are only present when carrying weight of body, as in sitting or walking. No pain when lying down. Any attempt to assume an erect position is accompanied by severe pains.

X-ray demonstrated sacrolization of fifth lumbar vertebra.

III.—CASE PRESENTED BY CAPTAIN COLLINS, C.A.M.C.

Sergeant G. Loss of function of right upper arm and shoulder. Paralysis of deltoid infra and suprascapularis muscles of five months' duration, little if any improvement in condition in that time.

IV.—PYLORIC ULCER

Case Presented by Captain Macleod, A.G.

Trooper P., aged forty-six, married. Previous history: two years ago while oiling a rip-saw, was struck by a piece of wood in right inguinal region, inflicting a superficial wound, which evidently became septic, as patient was confined to bed for six weeks. Parts were swollen and tender. Patient had rise of temperature. Since then he has had pain in right lower quadrant of abdomen, has been constipated and often passed blood in stool. Arrived in England in June, 1915, and was exposed to a great deal of cold damp weather. Reported ill on November 20th, complaining of pain in both shoulders and elbow joints. Admitted to hospital and while there developed gastric trouble. Immediately after eating he would suffer from sharp, stabbing, burning pains which seemed to go through to back. Always relieved by vomiting. Vomited once a good deal of dark brownish blood and also passed some dark tarry stools. Condition became worse, could not retain anything in his stomach, and suffered from pain in pit of stomach. Came to the Granville Canadian Special Hospital on January 7th, 1916, complaining of general pains all over abdomen, but especially marked on palpation over pyloric region. Tongue was heavily coated, large and fissured. Roof of mouth was covered with small red pustular sores. Teeth fairly good, but marked pyorrhœa was noted. Heart, lungs and kidneys normal, no enlargement of liver or spleen. Patient was of a highly nervous temperament, slept badly, and could not retain anything in his stomach. *X*-ray report after a bismuth meal: stomach empty in one and a half hours; cæcum in three hours; violent peristalsis, probably due to juxta-pyloric ulcer. Patient was put to bed and rectal feeding instituted for four days. Bovril, one ounce; saline, three ounces, every three hours; morphine sulphate, one-quarter grain, atropine sulphate, 1-150th grain.

Editorial

THE RECENT EPIDEMIC OF POLIOMYELITIS

DURING the past three months there has occurred in New York City and in certain limited areas throughout that State and the neighbouring States of Connecticut, Rhode Island, New Hampshire and New Jersey, the most serious epidemic of poliomyelitis of which we have any knowledge. This disease since the beginning of the present century appears to have gradually increased in the extent and severity of its ravages, until its prevalence in so many States to the south of us must be regarded as one of the most outstanding facts with which to-day our profession has to deal.

Epidemic poliomyelitis is a comparatively new disease. Scarcely half a century has elapsed since Heine published the first known description of the disease under the name of spinal infantile paralysis. Sporadic cases have doubtless occurred in the past. Sir Walter Scott is said to have suffered from it in early infancy. Sir William Osler suggests that this disease was the cause of Mephibosheth's lameness. The first obscurely recognized cases of an epidemic nature were reported by Colmer, of Louisiana, in 1843, who when describing a case of infantile hemiplegia, stated that other similar cases had occurred in the village. Not till 1881, however, have we any distinct record of an epidemic of this disease. In that year Bergenholtz reported eighteen cases in Northern Sweden, and in 1887 Medin described forty-three cases in Stockholm. Since then outbreaks have occurred frequently both in Europe and in America, and until the present have gradually increased in the number of children attacked, and, speaking generally, in the severity of the symptoms.

Thus far the epidemics both in Europe and America have been confined in great measure to the northern part of the temperate zone; and Southern Europe, and the Southern States of America appear to have escaped almost completely. A limited epidemic, however, is reported to have occurred in Cuba.

In Canada slight epidemics have occurred both in Nova Scotia and Ontario, but up to the present no extensive epidemic has developed, but sporadic cases have not been infrequent. It is evident, however, that unless great care is exercised this dire disease with its crippling results may develop suddenly in epidemic form. Careful investigation shows that the disease spreads along the ordinary routes of travel. Flexner calls attention to the fact that the epidemics of the States appear to have developed most severely in the seaboard cities at which immigrants land, and in the Western States where the largest number of Scandinavian immigrants settle. The virus of this disease, to a greater degree than is the case with other infectious diseases, appears to be subject to variations in which its virulence becomes increased or lessened, and at the same time also its powers of transmission, but the exact conditions under which these mutations of virulence occur have not yet been accurately determined. While it was seldom that in the sporadic cases of the past, physicians noted any indications of a conveyance of the infection from one child to others in the same family, the possibility of such transmission must now be regarded as definitely proven. Not only may the disease germs be conveyed from the sick to the well, but undoubtedly may be carried by those who have come in contact with the sick and thus infect others at a distance. In Norway Geirswold was able to trace transmission of the disease from one house to another and from the original village to others in the neighbourhood, by the passage of individuals who were acting unconsciously as carriers; and Shidler, of Nebraska, records the details of a case in which a woman with her child went to

the wedding of her sister in whose house a younger sister was ill with this disease. Nine days after the mother returned home, another of her children, who had not been away, came down with the disease, and in an adjoining house the children of a friend all developed the disease. There are many such instances recorded. In recent epidemics many instances have been observed where the disease has spread not only to other members of the same family, but has been conveyed by those in attendance to families at a distance.

It becomes imperative, therefore, that in such a disease the physician should insist on the strictest quarantine measures in the affected household, and exercise most careful precautions in his own person while attending the sick.

An important fact which has doubtless contributed greatly to the spread of the disease in the past is the number of so called "abortive" cases in which the disease is not recognized, and yet in which the organisms are present which may transmit the disease to others in a virulent form. In these atypical forms in which paralysis does not occur, and recovery from transient initial symptoms leaves the motor centres uninjured, diagnosis is always very difficult, especially as at the present all laboratory methods for the identification of the organism are extremely difficult and for the ordinary bacteriologist impossible. It must therefore be insisted that in every case in which any possibility of contagion may have occurred, our suspicions should be aroused by the following group of symptoms: headache, vomiting, moderate or slight pyrexia, pains in lower limbs, especially marked at night, or sometimes more general hyperasthesia, stiffness at the muscles of the neck, and generally diminished reflexes; sometimes early in the attack these may be increased. Associated with these symptoms there is a well-marked tendency to perspiration. In a few other instances the symptoms are more acute and severe and the disease has been regarded as cerebro-spinal fever. In every case in which the symptoms are suspicious but the diagnosis uncertain lumbar puncture should be performed early. In

poliomyelitis there is usually an increase in the lymphocytes and a very large percentage of polymorphonuclears which are very shortly replaced by mononuclears. In three or four days we have a pure lympho-cytosis. The albumin and globulin content of this fluid is increased, but less than in tuberculous meningitis. Draper, speaking at a recent symposium on the recent empidemic in New York, says: "The diagnosis is suggested by gastro-intestinal, respiratory, and febrile symptoms. Where we find these a search should be made for transient weakness and mild degrees of paralysis and for local muscle tenderness. One point of value is the anterior spinal flexion sign. It is very striking that before paralysis sets in the spinal flexion sign is definitely present, and is probably responsible for the stiff neck and Kernig's phenomenon. The sign is elicited by flexing the trunk forward, doubling the child anteriorly, so that head and hips approach. There is no question that these atypical cases exist, and are a frequent source of contagion."

To prevent contagion spreading, it may in many cases be possible, and certainly it will always be wise, to remove healthy children to another house or neighbourhood. All discharges from the nose, mouth and intestines of the sick child should be carefully disinfected. It is desirable that all attendants should wear uniforms and rubber gloves. The cleansing several times a day of the naso-pharynx by some bland antiseptic solution is essential, for it has been definitely proven that the microörganisms are eliminated by that membrane. All attendants should use similar precautions, and follow the cleansing with an oily spray, or the insufflation of fine pure kaolin powder, which has been strongly recommended by Hektoen and Rappaport as one of our best means of removing bacteria from nose and throat. In all our treatment, until some definitely specific treatment is discovered, rest should be a predominant idea, and our efforts should be directed to secure rest for muscles, nervous centres, and in older children for the mind. Good nursing is all important.

Hexamethylenamine is recommended by Flexner in full doses in the early stage. Its action, however, is only slight. Serum therapy may be of value if the serum can be obtained from persons who have passed through an attack within the previous four years. It should be injected daily for eight days after an equal amount of cerebro-spinal fluid has been withdrawn. In all cases where paralysis of the larger muscles remains expert orthopædic advice is indispensable and should be secured early.

Immunization is not yet practicable. Flexner tells us that no effective method free from danger has yet been found, but there is little doubt that within a short period some method will be discovered which will enable us more efficiently to combat this dire disease.

From the *American Bulletin of the Health Department of the City of New York* for July 8th, 1916, we clip the following:

"Poliomyelitis is regarded by the laity and by physicians alike as an acute disease, characterized by the early appearance of a more or less extensive flaccid paralysis. It has, however, widely varied manifestations. Wickman has classified the disease under eight types: 1, spinal poliomyelitis; 2, Landry's; 3, bulbar or pontine; 4, encephalitic; 5, ataxic; 6, polyneuritic; 7, meningitis; 8, abortive. The simpler classification of Peabody, Draper and Dochez, from the Rockefeller Institute, recognizes three types: 1, abortive cases without paralysis; 2, cerebral cases with spastic paralysis; 3, bulbo-spinal cases. Wickman considers that from 25 to 56 per cent. of the cases are abortive. These cases are likely to escape recognition and are, therefore, most important in their relation to public health, from their likelihood of spreading infection.

"The initial symptoms are very like those of the paralytic cases: fever, hyperæsthesia, drowsiness, headache, vomiting, varying degrees of stiffness of the neck, Kernig, and a positive Macewen. Seen during the first twenty-four or thirty-six hours, the diagnosis from epidemic meningitis can be made

in no way except by lumbar puncture, and even this is sometimes confusing without microscopic examination, as the fluid at this stage may be slightly turbid. The diagnosis from other acute infections of childhood depends to some extent on the greater degree of hyperæsthesia and also on the examination of the spinal fluid, which in meningism from other diseases is normal. Recovery may take place in a few days. No diagnosis may be made unless expert consultation is obtained early. On the other hand, the symptoms may run on for two or three weeks. There often develop loss, diminution or inequality of the knee jerks and loss of the pupillary reflexes. At this stage the differential diagnosis from tubercular meningitis is very difficult, and lumbar puncture, while helpful, is by no means positive, the fluids in the two conditions being often very similar. In many cases there is a varying degree of weakness, often transient, and slight facial palsies are frequent. These abortive cases very evidently constitute the most dangerous foci for the dissemination of the disease.

"A very unusual manifestation of poliomyelitis is blindness. The meningitis division of the Department of Health has seen two such cases, one being in the present epidemic. In the first case, the vision was restored at the end of about three months. The second was a quite recent case and the blindness still persists. Cases with the bulbar type of paralysis, with difficulty in speaking and swallowing, are not uncommon in this epidemic and have, in some instances, been diagnosed as croup. In a fairly large number of cases, a rapidly ascending type of paralysis has been present, involving the muscles of respiration and ending with death. Some of these, when seen late, after pulmonary œdema has developed, have been diagnosed as bronchopneumonia. The fatalities of the present epidemic have been largely due to these two types of the disease.

"The spinal fluid in poliomyelitis is usually clear and increased in amount. The albumin and globulin are increased in varying degrees, and there is usually a good reduction of

Fehling's. The cellular increase ranges from slightly above normal to over 900 cells per cubic centimetre. Early in the disease the cells may be 50 per cent. or more polymophonuclears. Later there are usually 90 per cent. or more mononuclears. There are frequently large mononuclear cells that seem somewhat characteristic of these fluids.

"Two rather unusual varieties of fluid are sometimes seen, probably the result of an extremely pronounced hæmorrhagic condition. In one type the blood is evidently fresh and is uniformly admixed with the spinal fluid, thereby differentiating it from blood obtained from the accidental puncture of a vein. Evidence of an older hæmorrhage occurs in the second type, which presents a yellow fluid, coagulating spontaneously."

THE TUBERCULOUS SOLDIER

THE tuberculosis problem in connexion with the soldiers of the Canadian Expeditionary Force has been of late carefully considered by the Military Hospitals Commission. On September 15th, a meeting of experts, consisting of Dr. Baldwin of Saranac Lake, Drs. Parfitt and Elliott of Muskoka, and Dr. Byers of Ste. Agathe, met some of the Commissioners. Dr. F. J. Shepherd, of Montreal, was in the chair and Lieutenant-Colonel A. Thomspon, medical superintendent of all the hospitals under the Commission, was also present. It was reported that at present there are some three hundred and ninety-seven patients under treatment in the various sanitaria for tuberculosis throughout the country. Nearly sixty per cent. of these soldiers have never been overseas. Many of these cases should never have enlisted but having been accepted the country must provide for them. It is anticipated that some thirty patients monthly may be expected from overseas and these with the cases which develop here in the various camps, it is estimated, by the spring will amount to over four hundred cases. These will have to

be arranged for. The experts advised making temporary arrangements immediately with existing sanitaria for the treatment of these cases for the coming winter and indicated methods by which inexpensive temporary buildings could be provided. They also advised the purchase of property in localities suitable for the treatment of tuberculosis and erecting thereon permanent buildings of the most modern type. Already the West is provided for to a great extent by securing the use of the sanitarium at Frank, Crowsnest Pass, Alberta. This commodious building will hold one hundred and twenty patients and, with the already existing sanitaria at Tranquille, Kamloops, British Columbia, Ninette, Manitoba, and Calgary, will afford sufficient accommodation for the present. Quebec will be provided for at Lake Edward and Ste. Agathe. The Lower Provinces will be accommodated partly in Quebec and also at the sanitaria already existing at St. Johns, New Brunswick, Kentville, Nova Scotia, and Charlottetown, Prince Edward Island. In connexion with the sanitaria workshops and recreation rooms will be provided, and occupation suitable to the patients' condition will be insisted upon. The great difficulty is keeping the patients under treatment when they are progressing favourably as after six months they can demand their discharge and go upon a pension. The discipline will be maintained by returned combatant officers who will take military charge of the men.

A PERMANENT PENSIONS BOARD

A PERMANENT Board of Pension Commissioners has been appointed by the Government under the chairmanship of Mr. J. K. L. Ross, of Montreal. The other members of the Board are Colonel R. H. Labatt and Major J. L. Todd, associate professor of parasitology in McGill University. Major Todd, who was a member of the Pensions and Claims Board in England, has made a careful study of the pensions

systems of Great Britain and France and has a wide knowledge of this important question. The members are to hold office for ten years, the presumable object of this arrangement being the elimination of any possible political influence in the administration of pensions according to the scale prepared.

Pensions will be awarded in direct proportion to the disability incurred and disabled men who have been discharged from the army will be divided into the following six classes:

Class I.—Total disability—100 per cent.

Class II.—Disability 80 per cent. and less than 100 per cent., pension 80 per cent. of Class I.

Class III.— Disability 60 per cent. and less than 80 per cent., pension 60 per cent. of Class I.

Class IV.—Disability 40 per cent. and less than 60 per cent., pension 40 per cent. of Class I.

Class V.—Disability 20 per cent. and less than 40 per cent., pension 20 per cent. of Class I.

Class VI.—Disability under 20 per cent., a gratuity not exceeding $100.

The following is the scale of pensions for total disability:

	Yearly
Rank and File	$480
Squad, Battery or Company Sergeant-Major; Squad, Battery or Company Quartermaster Sergeant; Colour Sergeant; Staff Sergeant	510
Regimental Sergeant-Major not Warrant Officer; Master Gunner not Warrant Officer; Regimental Quartermaster Sergeant	620
Warrant Officer	680
Lieutenant	720
Captain	1,000

To those up to and including the rank of lieutenant, who are totally disabled and in addition are totally helpless so far as attendance to their physical wants is concerned, a further allowance may be made of an amount not exceeding

$250 a year, but such special allowance shall be subject to annual review.

Those, up to and including the rank of lieutenant, who are disabled and are entitled to a pension in the 1st, 2nd or 3rd class, shall be paid in addition to the personal pension, a special allowance of $6 a month for each child; of the rank of captain $7 a month for each child.

If a member of the forces has been killed his widow is entitled to 80 per cent. of the total disability until she remarries, when her pension will cease, but she will receive one year's gratuity. She is also entitled to draw the allowances for children. These allowances for children are up to the age of sixteen for a boy and the age of seventeen for a girl. If a child is suffering from a mental or physical infirmity then it is left to the discretion of the Commissioners whether the allowance shall be continued longer or not.

If a widower is killed, then each child is entitled to receive $12 per month.

A widowed mother, stepmother or grandmother wholly dependent upon a member of the forces who has been killed, is entitled to 60 per cent. of the total pension. This also applies to a father who was wholly dependent on a son who has been killed in the service.

The Board of Pension Commissioners also have authority to make provision for the vocational training of returned soldiers and for the supply, from time to time, of artificial limbs and appliances.

THE CLAYTON CONVALESCENT HOME

THE opening of the Clayton Convalescent Home at Halifax on September 21st, is of particular interest as it is the first institution to be established in Canada for the express purpose of the educational, vocational, and physical training of disabled soldiers. Such training is now in progress in other institutions in this country, for instance in the Con-

valescent Hospital established at the Grey Nunnery, Montreal, and other centres, but the Clayton Convalescent Home is the first Canadian hospital devoted exclusively to vocational training.

It has been presented to the Military Hospitals Commission by its founder, Mr. W. J. Clayton, of Halifax. The furnishing and equipment of the workshop has been carried out under the able direction of Professor Sexton, of the Technical College, Halifax, and provision has already been made for instruction in cobbling, tailoring, and automobile driving. Arrangements will be made later for instruction in other trades.

The first patients to be received into this hospital were Jamaican soldiers, seventeen in number, whose feet were frozen last winter on board the transport that was conveying them to England. These men have been undergoing treatment in the Halifax Military Hospital and, unfortunately, it has been necessary in most of these cases to amputate one or both feet. The men will now be furnished with artificial limbs and will be given instruction in some trade which, upon their reëntry into civil life, will enable them to be self-supporting.

A CANADIAN society composed of nurses and doctors has been formed in Paris and meets once a month for the discussion of scientific and professional questions. The first meeting took place on September 4th in the great theatre of the Sorbonne. Among those present were most of the professors of the Paris Faculty of Medicine. Professor Landouzy, the dean, who presided, welcomed the Canadians who had come to defend the cause of justice "as much by filial piety towards France as by loyalty to the United Kingdom." Colonel de Martigny in replying, said "Our brothers in khaki fight side by side with yours, happy, if need be, to sleep their last sleep in the sweet land of France." Professor Albee of New York delivered an address on bone grafts.

From the statistics compiled by Mr. J. N. MacLean, chief of the license inspectors in the province of Manitoba, it would appear that the vigorous enforcement of the Temperance Act is producing splendid results. It is too early yet to speak with any degree of certainty but up to the present time the results have been most satisfactory. The amount of drunkenness in the province has been reduced by 80 per cent. as compared with the three months immediately preceding the enforcement of the Act. In Brandon the convictions for drunkenness during the months of March, April and May of this year numbered 133; those during June, July and August only 19. Moreover the convictions for crime in the province have fallen from 813 during March, April and May to 161 during June, July and August.

An analysis of the causes of invalidity in respect of claims under the Australian Invalid and Old Age Pensions Act has been made by Dr. Cumpston, Director of Quarantine in the Commonwealth. The Act came into force on November 19th, 1910, and up to August 27th, 1915, 27,484 pensions were granted to persons who had become permanently incapacitated in Australia through disease or accident not self-induced and not brought about in order to obtain the pension. As might be expected, the greatest number of pensions—35·64 per cent. of the total—were granted to persons between the ages of fifty and sixty; between forty and fifty the percentage was 18·26, and between the ages of sixteen and twenty it was 5.57. The causes of invalidity included rheumatism, including probably all joint affections but not valvular disease of the heart, in 2,714 cases; phthisis, including miner's phthisis in 2,532 cases of which 42 per cent. were under forty years of age and 21·1 per cent. under thirty; syphilis, disorders of the circulatory system, hemiplegia, accident, senility, defective vision, congenital imbecility, epilepsy, degeneration of the spinal cord, tubercular bones and joints, cancer and varicose

veins. Dr. Cumpston assumes that all cases entered as degeneration of the spinal cord, insanity, epilepsy, congenital imbecility, and congenital malformation, are dependent to some extent upon syphilis and places the number of cases in which invalidity may be attributed to that disease at 3,775. Since 6,519 of the cases recorded were persons under the age of forty, a special investigation has been undertaken to determine the causes of permanent incapacity in persons under forty years of age and the best means of its prevention. Dr. Cumpston attributes the majority of the cases to tuberculosis, syphilis, or gonorrhœa. He is of opinion that a large number of pensions are granted to persons who are suffering from preventable diseases such as syphilis and tuberculosis, or from affections that could have been prevented by early treatment, and he recommends a comprehensive scheme of national insurance as the most effective means of remedying the situation.

An abstract of the Report of the Royal Commission on Venereal Diseases was published in the April number of this Journal. The recommendations of the Commission, in so far as the provision for diagnosis and treatment is concerned, have been put into operation by the Local Government Board, London, by an order dated July 12th, last. The regulations of the order provide that the council of every county and county borough (1) shall, subject to the approval of the Board, make arrangement for enabling any medical practitioner practising in the area of the council to obtain, at the cost of the council, a scientific report on any material which the practitioner may submit from a patient suspected to be suffering from venereal disease; and (2) shall prepare and submit to the Board a scheme (*a*) for the treatment at and in hospitals or other institutions of persons suffering from venereal disease, and (*b*) for supplying medical practitioners with salvarsan or its substitutes for the treatment and pre-

vention of venereal disease. It is not the intention that special laboratories shall be established for the diagnosis of venereal disease, but that the facilities existing in universities and large hospitals shall be utilized and made available for the whole population of the area in which they are situated, specimens sent by any doctor practising in that area to be examined without cost to the patient or doctor. If the requisite facilities are not to be found within the area of the council, an institution outside that area may be chosen, provided it is accessible from the more densely populated parts of the area. The treatment provided is to be available to all comers, irrespective of the place of residence or the means of the patient and no distinction will be made between these patients and those undergoing treatment for other diseases. Payment for services rendered will be made to the hospital authorities by the council of the county and will be in the form of a lump sum annually, subject to revision in the light of experience. As recommended by the Royal Commission, 75 per cent. of the cost of carrying out the scheme will be met from Imperial funds, and the balance will be paid by the municipality.

It will be seen that the general idea of the scheme is to provide the best means of diagnosis and treatment for all persons suffering from venereal disease. The work of treatment is to be closely associated with the general practitioner, to whom all laboratory facilities are to be free. The hospital clinics are to be open to medical students and doctors and it is hoped that they may constitute a means of disseminating the latest knowledge concerning diagnosis and treatment among all members of the profession.

Miscellany

Book Reviews

Manual of Vital Function Testing Methods. By Wilfred M. Barton, M.D., associate professor of medicine, Medical Department Georgetown University. 255 pages. Boston: Richard G. Badger. Toronto: The Copp Clark Co., Ltd., 1916. Price $1.50.

This small volume represents a careful effort to collect in one volume all the necessary data for carrying out the various functional tests to determine the efficient action of the more important organs in the body, namely, the liver, kidneys, heart, pancreas and ductless glands. It is a collection that must prove of great service to every practitioner, especially to those who are interested in this very practical and ever-developing field of clinical pathology. A careful examination of the volume has shown us that the writer's work has been thoroughly and carefully performed. It is a volume to be recommended.

The Treatment of Acute Infectious Diseases. By Frank Sherman Meara, M.D., Ph.D., professor of therapeutics in the Cornell University Medical College in New York City. New York: The Macmillan Company.

In this very practical volume Dr. Meara writes not only as a careful observer and diagnostician, but as an able therapeutist. Each chapter deals with an individual disease in a thoroughly practical manner. The volume is one which we can strongly recommend both to physicians and students. The first two chapters deal with the general principles of treatment and with diet in acute and infectious disease. The facts stated are well worth the earnest consideration of every physician. The chapters on the special diseases are in our opinion very carefully written. We have read them all and thoroughly enjoyed them, and shall consider the book a valuable addition to our library.

A Handbook of Infant Feeding. By Lawrence T. Royster, M.D., attending physician Bonney Home for Girls and Foundling Ward of the Norfolk Society for the Prevention of Cruelty to Children. Illustrated, 120 pages. St. Louis: C. V. Mosby Company, 1916. Price $1.25.

This is a small volume but it covers the ground well. It is written in a clear and interesting manner and can be recommended to students and to every physician who desires to grasp quickly the essentials of infant feeding. Dr. Lovett Morse has written the chapter on the stools in infancy.

Diagnostic Methods, Chemical, Bacteriological and Microscopical. A Text-Book for Students and Practitioners. By Ralph W. Webster, M.D., Ph.D., assistant professor of pharmacological therapeutics and instructor in medicine in Rush Medical College, University of Chicago. Fifth edition, revised and enlarged, with 37 coloured plates and 171 other illustrations; 758 pages. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut St., 1916. Price, $4.50 net.

This is the fifth edition of a work that has already made a reputation for itself. It represents all that is valuable and practical in our laboratory methods, and must prove of great value to everyone who wishes to know the exact details of all our modern methods with full instructions as to any likely obstacles that may interfere with results. We cordially recommend the work to our students and graduates.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

The Dream Problem: Nervous and Mental Disease Monograph No. 22. By Dr. A. E. Maeder, of Zurich. Authorized translation by Drs. Frank M. Hallock and Smith Ely Jellieffe, of New York. New York: Nervous and Mental Disease Publishing Company, 1916.

Obstetrics, Normal and Operative. By George Peaslee Shears, B.S., M.D., professor of obstetrics and attending obstetrician at the New York Polyclinic Medical School and Hospital. 745 pages with 419 illustrations. Philadelphia and London: J. B. Lippincott Company, 1916.

The Basis of Symptoms: The Principles of Clinical Pathology. By Dr. Rudolph Krehl, ordinary professor and director of the Medical Clinic in Heidelberg. Authorized translation from the seventh German edition by Arthur F. Beifeld, Ph.B., M.D., instructor in medicine, Northwestern Medical University School, Chicago. Third American edition, 517 pages. Philadelphia and London: J. B. Lippincott Company, 1916.

The Problems of Physiological and Pathological Chemistry of Metabolism. For Students, Physicians, Biologists and Chemists. By Dr. Otto von Furth, professor extraordinary of applied medical chemistry in the University of Vienna. Authorized translation by Allen J. Smith, professor of pathology and of comparative pathology in the University of Pennsylvania. 667 pages. Philadelphia and London: J. B. Lippincott Company, 1916.

The Art of Anæsthesia. By Paluel J. Flagg, M.D., lecturer in anæsthesia, Fordham University Medical School; anæsthetist to Roosevelt Hospital. 341 pages with 136 illustrations. Philadelphia and London : J. B. Lippincott Company, 1916. Price $3.50.

Yellow Fever Commission (West Africa). Reports on Questions connected with the Investigation of Non-Malarial Fevers in West Africa. Volume III. Price 10/6 nett. Fourth and Final Report, price 5/- nett. Publishers: J. & A. Churchill, 7, Great Marlborough Street, London W., 1916.

Diseases of the Digestive Tract and Their Treatment. By A. Everett Austin, A.M., M.D., former professor of physiological chemistry at Tufts College, University of Virginia, and University of Texas. 552 pages with 85 illustrations. Publishers: C. V. Mosby Company, St. Louis, 1916. Price $5.50.

MENTALLY DEFICIENT CHILDREN, THEIR TREATMENT AND TRAINING. By G. E. SHUTTLEWORTH, B.A., M.D., fellow of King's College, London, and W. A. POTTS, M.A., M.D., medical officer to the Birmingham Committee for the care of the Mentally Defective. Fourth edition, 284 pages. London: H. K. Lewis & Co., Ltd., 136 Gower Street, W.C.; Philadelphia: P. Blakiston's Son & Co., 1916. Price 7/6 nett.

INFECTIONS OF THE HAND: A GUIDE TO THE SURGICAL TREATMENT OF ACUTE AND CHRONIC SUPPURATIVE PROCESSES IN THE FINGERS, HAND AND FOREARM. By ALLEN B. KANAVEL, M.D., assistant professor of surgery, Northwestern University Medical School, Chicago. Third edition; thoroughly revised. 498 pages with 161 illustrations. Lea & Febiger : Philadelphia and New York, 1916. Price $3.75 nett.

SKIN CANCER. By HENRY H. HAZEN, A.B., M.D., professor of dermatology in the Medical Department of Georgetown University. 250 pages with 97 illustrations. Publishers: C. V. Mosby Company, St. Louis, 1916. Price $1.40.

DISEASES OF THE SKIN. By RICHARD L. SUTTON, M.D., professor of diseases of the skin, University of Kansas School of Medicine. 916 pages with 693 illustrations. Publishers: C. V. Mosby Company, St. Louis, 1916. Price $6.50.

Retrospect of Literature

ULCERO-MEMBRANOUS STOMATITIS AND GINGIVITIS AMONG TROOPS; ITS CAUSE AND TREATMENT. By Frederick B. Bowman, M.B., Captain, C.A.M.C., Pathologist to Moore Barracks, Canadian Military Hospital, England. *Proc. Roy. Soc. Med.*, 1916, vol. ix (medical section), pp. 51-60.

During the past few months a large number of cases of severe ulcerative conditions of the throat and mouth have occurred among the Canadian troops in England and the British troops in France. The infection is communicable and is due, apparently, to Vincent's organism, the spirochætæ and fusiform bacilli being present in large numbers. Amœbæ, streptococci, etc., have been found also, but it is only with the disappearance of Vincent's organisms that the condition undergoes cure and this fact may be

taken as adequate proof that these organisms are an essential factor in the causation of the disease. When the gums are attacked the condition is more acute than ordinary pyorrhœa and the state of the mouth in advanced cases strongly suggests scurvy. There is more or less glandular enlargement, the submaxillary and sublingual glands being most frequently affected. The throat condition resembles that seen in syphilis and in some cases cannot be diagnosed clinically from that disease; therefore a Wassermann reaction should be done in all suspicious cases before a definite diagnosis is made or treatment begun. The therapeutic test is valueless as one full dose of salvarsan will usually clear up a badly ulcerated throat due to Vincent's organism. In the series reported by Captain Bowman the temperature varied between normal and 102° F., never rising in any instance to 105° or 108° F. as described by Chalmers and Wilson. Severe depression is a constant and marked symptom of the condition, constitutional disturbance is present, and the breath is extremely fœtid. The gums bleed easily, are injected, retracted from teeth, and spongy in appearance. Sometimes the condition becomes chronic and may persist for months.

Treatment.—Emetine has been found to be of no value in the more widespread forms of the disease. Salvarsan has marked effect upon the condition but its use among troops is prohibited both on account of its cost and the instability of its solutions. The use of the following prescription has been found to be effective and the throat, even when deeply ulcerated, may be healed in a short time with a solution of wine of ipecac, 1 oz.; glycerine, 1 dr.; Fowler's solution, 3 dr.; to be used as a mouthwash.

The infection of the gums is very persistent but may be ameliorated and usually cured by the same solution. The pus should be wiped away and the solution carefully applied to the gums and pockets around the teeth. A small applicator should be used. All patients are instructed to drop ten or fifteen drops of the mixture on to a toothbrush twice a day and to brush the teeth and gums vigorously. A paste containing both Fowler's solution and ipecacuanha wine, in small tins, is now issued from the dispensary of Moore Barracks Hospital to be used in combination with the solution. Both paste and solution are marked "Poison" and the patient is instructed to swallow as little as possible of the solution while washing the teeth.

The attention of medical officers in charge of troops is directed to the condition, which is quite common both in England and France, and to the above simple remedy.

Obituary

SIR LAUDER BRUNTON, Bart.

It is with much regret that we have to announce the death of Sir Lauder Brunton, Bart., on September 16th, of advanced arteriosclerosis, at his home in London. He had recognized for several months that the end was coming quickly. Attacks of anginal pain occurred on slight exertion, and about the middle of August he wrote to his friends in Montreal that he knew he could not live longer than a few weeks more.

Sir Lauder Brunton may be regarded as the father of English pharmacology. As a student of Schmiedeburg he devoted much time to the study of the exact action of drugs, and his large volume on "Pharmacology, Materia Medica and Therapeutics" was for many years regarded as the best presentation in English of modern pharmacology. He was a prolific writer, and all his contributions to therapeutics and medicine were characterized by sound judgement and careful clinical observation. Among his best known works are the following: "Relation of Chemical Structure to Physiological Action"; "Disorders of Digestion"; "Disorders of Assimilation"; "Lectures on the Action of Remedies"; and there were many others. His younger son at the commencement of the war resigned his position as resident physician in St. Bartholomew's Hospital and joined the army; unfortunately he was killed in action. His eldest son, who was married recently to the daughter of Professor J. B. Porter of McGill University, is at present serving on Brigadier-General Wilson's staff at Valcartier.

PROFESSOR GREGOR BRODIE, F.R.S.

Physiology has sustained a very severe loss by the death of Dr. Thomas Gregor Brodie, Professor of Physiology in the University of Toronto. Professor Brodie died in London on August 20th, in his fiftieth year. He was the son of an English clergyman and was educated at King's College School and at St. John's College, Cambridge. Dr. Brodie held successively the following appointments: Demonstrator of Physiology at King's College, London; Lecturer on Physiology at St. Thomas' Hospital; Director of the Research Laboratories of the Royal Colleges of Physicians and

Surgeons, London; Superintendent of the "Brown" Animal Sanatory Institute, London. For ten years Dr. Brodie was lecturer on Physiology at the London School of Medicine for Women. In 1908 he was appointed to the Chair of Physiology at Toronto. He was made a Fellow of the Royal Society in 1904, and appointed Croonian Lecturer to the Society in 1911; he was also a Fellow of the Royal Society of Canada.

Professor Brodie was a lucid lecturer and a most skilful experimentalist. His researches on the gaseous metabolism of animal tissues and organs, both alone and in conjunction with a number of co-workers, have been of the greatest value in promoting the progress of physiology. Professor Brodie was an authority on the mode of activity of the kidney. His book, "The essentials of experimental physiology," is one of the very best manuals on that subject.

On the outbreak of the war, Dr. Brodie gave his services to the C.A.M.C., No. 4 Canadian General Hospital, and was promoted to the rank of Captain. In this capacity he rendered valuable service in the investigations into the physiological aspects of the lesions produced by the gas used by our enemies in the earlier months of the war.

Professor Brodie is survived by a widow and three sons.

LIEUTENANT-COLONEL ROLAND PLAYFAIR CAMPBELL, M.D.

The news that reached Montreal on September 20th, that "Bly" Campbell had met his death at the front in France from a shell which destroyed the dressing station in which he was working, was a great shock to the medical community of Montreal. He was a universal favourite and was looked upon as the most able of the younger surgeons. Dr. Campbell was born in Montreal in 1876 and was the son of the Reverend Professor J. Campbell, LL.D. and Mary Helen Playfair. After passing through the High School, he entered the Arts Faculty of McGill University and graduated in 1897 with honours. He then entered the Faculty of Medicine and graduated in 1901 with honours in all subjects. He immediately joined the staff of the Montreal General Hospital as an interne and remained two years doing excellent work and achieving a reputation as a most efficient, able and painstaking man, always on hand and putting duty invariably before pleasure. He afterwards was some time in Germany as second assistant to

the celebrated Professor Mickulicz of Breslau. On his return to this country he was appointed medical superintendent of his old hospital and after holding this position for two years was appointed an out-door surgeon. As he had always paid particular attention to genito-urinary surgery, on the establishment of this department at the General Hospital he was appointed chief of clinic and held this position at the time of his death.

When the war started, Lieutenant-Colonel Campbell was in command of No. 5 Field Ambulance and went with it to Valcartier. For some reason or other he was not given the command for overseas but joined No. 1 General Hospital under Colonel Murray MacLaren and spent the ensuing winter on Salisbury Plains. In 1915 he returned to Canada to form and command No. 6 Field Ambulance and on July 15th of that year went to France and had been doing most valuable work there up to the time of his death. His ambulance was for a long time near Ypres but latterly had been removed to the Somme front.

The loss of Dr. Campbell will be much felt both by the General Hospital and McGill University, where he had earned a reputation for himself as an investigator and teacher. In his own specialty he was recognized as an authority both at home and abroad and promised much for the future had he survived. In addition to his wide knowledge of genito-urinary and general surgery, Lieutenant-Colonel Campbell was an expert pathologist and bacteriologist. He had the confidence of his colleagues and would in time have been a great consultant. Notwithstanding his great knowledge, his was a very modest nature and although "knowledge is the prerogative of youth" he knew he had much to learn and was always ready to acquire more knowledge. Lieutenant-Colonel Campbell was beloved by all his brethren for his own sake, his nature was not aggressive but was full of "sweet reasonableness" and he was always ready to pour oil on troubled waters. Although not aggressive he was sure of his opinions and had a knowledge so certain that when he had thought out a problem and come to definite conclusions he was unshakable in his position. The universal feeling of regret among his colleagues both in college and hospital and the many testimonies offered as to his skill and ability amongst the profession at large give good evidence of the estimation in which he was held. All who have known him feel that they have lost a dear friend as well as a distinguished colleague.

Dr. Daniel Hennessy, of Bangor, Maine, died September 10th, in the eightieth year of his age. He was born in 1836 at Bandin, Ireland, and his early life was spent on a farm in Melrose, Westmoreland County. Educated at Mount Allison University, then the Mount Allison Wesleyan Academy, and St. Dunstan's College, Charlottetown, he afterwards entered the Geneva Medical College, now the University of Syracuse, where he obtained his medical degree. He practised for a time at Pointe de Bute, New Brunswick.

Dr. George Sanson died at the Royal Victoria Hospital, Victoria, British Columbia, on September 5th. He was born at Petrolea, Ontario, in 1862. For a time he was surgeon of the western division of the Canadian Pacific Railway and, in 1888, went into practice at Vernon. The following year he removed to Clinton and later went to Lilloote and then to Ashcroft, where he was practising when taken ill.

Dr. W. E. Milne, of Manchester, England, died suddenly at Vancouver on September 5th.

Dr. J. E. Dohan, of Three Rivers, Quebec, died on September 10th, after a few hours illness.

Dr. James E. Schon, of Vernon, British Columbia, died suddenly from heart disease.

Dr. A. Goltman, who died at Montreal on September 15th, graduated from McGill University in 1896 and completed his medical studies in Edinburgh and London. He practised at Sioux Falls, South Dakota. He leaves a widow and three daughters.

Dr. Gilbert Tweedie, of Toronto, died August 23rd, in the ninetieth year of his age. A native of Dumfriesshire, Scotland, he entered the University of Edinburgh with the intention of qualifying to be a medical missionary but came to Canada before he had completed his studies. He entered Knox College, Toronto, in due course was ordained, and became Presbyterian minister at Lindsay. He was unable to continue his work, however, because of a throat affection and returned to the study of medicine at the University of Toronto. Dr. Tweedie practised in Dresden, Ontario, for some

years and, in 1891, became medical superintendent of the Riverdale Hospital, Toronto. He retired in 1908.

Dr. F. R. Chapman, of Saskatoon, died at St. Paul's Hospital on August 29th. He was born at Toronto in 1880 and graduated from the University of Toronto in 1908. He practised for a short time at Lanigan before going to Saskatoon where he became medical officer of health. For the past two years he had been in private practice. His death was due to an unfortunate accident, he having taken carbolic acid by mistake. A widow and one child are left to mourn him.

Dr. Joseph Lockary died at St. Stephen, New Brunswick, on August 14th, in the forty-ninth year of his age. He was in practice at West Roxbury, Massachusetts.

Dr. F. D. W. Bates, of Hamilton, died August 25th, after a short illness. Dr. Bates was well known in Hamilton where he had practised for some years. He was a specialist in diseases of the eye, ear, nose and throat.

Dr. Cyrus Ross MacIntosh, of Creelman, Saskatchewan, died August 24th, in the thirty-fifth year of his age. After graduating in Arts from Dalhousie University, he entered the Manitoba Medical College, where he graduated in 1908. He then went into practice at Lauder, Manitoba, and seven years later entered the mercantile marine as ship's surgeon. Dr. MacIntosh returned to Canada about two years ago and took up practice at Creelman. He leaves a widow.

News

ONTARIO

Owing to his prolonged absence on active service, Colonel H. A. Bruce has resigned from the presidency of the Toronto Academy of Medicine. Dr. John Ferguson has, therefore, been elected president, and Dr. D. J. Gibb Wishart vice-president, of the Academy.

THE following contagious and infectious diseases were reported in the province during the month of August: smallpox, 5 cases; scarlet fever, 37 cases; diphtheria, 183 cases, 11 deaths; measles, 243 cases; whooping cough, 190 cases, 7 deaths; typhoid, 190 cases, 18 deaths; tuberculosis, 103 cases, 69 deaths; infantile paralysis, 44 cases, 5 deaths; cerebrospinal meningitis, 20 cases, 15 deaths.

THE Alexandra Hospital at Ingersoll is to be enlarged by the addition of a new wing, which will be known as the Dr. Carroll wing.

QUEBEC

THE semi-annual meeting of the College of Physicians and Surgeons of the Province of Quebec took place at Montreal on July 12th, under the presidency of Dr. Arthur Simard, of Quebec. On this occasion it was decided that the number of governors of the College should be reduced.

MANITOBA

DR. G. A. PAILLE, of St. Charles, has been appointed house surgeon to the St. Boniface Hospital, Winnipeg.

ALBERTA

THE Military Hospitals Commission has taken over the Rocky Mountain Sanatorium, near Frank, for the treatment of soldiers suffering from tuberculosis. The sanatoriums at Ninette, Manitoba, and Tranquille, British Columbia, are already filled. Captain A. E. Porter has been appointed medical superintendent of the Rocky Mountain Sanatorium.

SASKATCHEWAN

A HOSPITAL is to be built at Edam. It will be named The Lady Minto Hospital of Edam.

BRITISH COLUMBIA

A GRANT of $1,000 has been made by the provincial government to the Jubilee Hospital at Vernon.

MEDICAL COLLEGES

Dalhousie University

WORK in all the five years of the medical curriculum began at the University of Dalhousie on September 20th. The number of freshmen is about twenty, which number includes four women students. There is a good entry also in the faculty of dentistry.

There have been a few changes in the teaching staff in the medical faculty—Dr. George MacIntosh and Dr. Carney are appointed lecturers in systematic medicine.

By kind permission of Colonel Grant, head of the Army Medical Department at Halifax, the faculty of medicine has been permitted to make use of the medical and surgical wards in the Military Hospital for teaching purposes. By this arrangement a large amount of clinical material will be available for instructional purposes.

McGill University

CAPTAIN J. K. BERTRAM, who was killed in action on September 22nd, was the son of Dr. T. A. Bertram, of Dundas, Ontario. He was a fourth-year medical student at McGill University and was in the twenty-sixth year of his age.

ARMY MEDICAL SERVICES

THE following officers have been transferred from the R.A.M.C. to the C.A.M.C.: Captains G. W. R. Stone, of Parry Sound, Ontario; S. R. Johnstone, of Dartmouth, Nova Scotia; N. B. Taylor, of Toronto; D. W. Wade, of Cranbrooke, British Columbia. Other officers who have joined the C.A.M.C. are: Captain Armand Paré, of Pointe aux Trembles, Montreal, previously with the French Red Cross; Captains J. H. Watters, of Quebec, and J. H. A. Paquette, of Montreal, who saw service in Serbia; Captains G. E. Binkley, of Hamilton, G. A. McPherson, of Toronto, G. M. Hanna, of Brantford, and W. G. Lougheed, of Toronto.

THE following doctors have joined the R.A.M.C.: Dr. W. G. Weaver, of Fredericton, New Brunswick; Dr. Moyse, of Dugald, Manitoba; Lieutenant James Robertson Kerr, C.A.M.C.; Lieutenant W. C. Connell, C.A.M.C.

DR. A. BLAIS, of Edmonton, has joined the staff of No. 4 Stationary Hospital at St. Cloud, Paris.

Captain Publow, of Kingston, has been appointed Medical Officer to the 155th Battalion in succession to Captain Harper, of Madoc.

Major W. H. Irvine, C.A.M.C., of Fredericton, New Brunswick, has joined a field ambulance for overseas service.

The following promotions in the Canadian Army Medical Corps have been announced: To be temporary Colonel: Lieutenant-Colonel C. W. F. Gorrell. To be temporary Lieutenant-Colonel: Major F. H. Mewburn. To be temporary Majors: Captain J. M. Nettleton, P. G. Bell and H. W. Coates. To be temporary Captains: R. A. Kennedy, J. G. Wilson, J. G. Sutherland, G. S. Williams (late Lieutenant R.A.M.C.), R. B. Crompton, D. A. Webb, Captain T. A. Watterson (Canadian Militia), Captain H. S. Smith, Lieutenant W. A. Smith, Sergeant H. W. Byers, Lieutenant H. B. Northover. Major W. Creighton to revert to the temporary rank of Captain at his own request. To be temporary Lieutenant: R. D. Ferguson.

The Military Cross has been conferred by His Majesty upon Lieutenant William John Knight, R.A.M.C., "for conspicuous gallantry and devotion to duty when in charge of an advanced dressing station under heavy shell fire. He continued to attend the wounded with great coolness." Lieutenant Knight was born in Huron County, Ontario, and graduated from Western University in 1911. He was house surgeon at St. Joseph's Hospital, London, Ontario, before he joined the colours.

Captain R. D. Sanson, C.A.M.C., has been declared medically unfit for further service. Captain W. A. Smith, C.A.M.C., is granted three months sick leave.

Major Allan Rankin, C.A.M.C., has been appointed medical officer in charge of the water supply of the Canadian Corps Area and is attached to the office of the Deputy Director of Medical Services. He is also acting as secretary to the Corps Water Board.

Lieutenant-Colonel S. W. Prouse is the commandant of No. 4 Casualty Clearing Hospital, which was recently recruited in Winnipeg. The other officers are: Majors E. T. Cadham and

W. W. Musgrove, Captains D. F. McIntyre, Jas. Pullar, and J. O. Todd, and Captain R. B. Mitchell, Adjutant.

THE Military Cross has been awarded to Captain John R. Irwin, R.A.M.C., of Cobourg, Ontario. Captain Irwin was summoned to Windsor Castle and received the decoration from the hands of His Majesty.

DR. FARRELL, of Tweed, Ontario, has joined the C.A.M.C.

DR. TOM SAVAGE, of the French Hospital, New York, has joined the staff of the Chateau-de-Passy Hospital, France. He has been given an honorary rank in the French service.

CASUALTIES

Killed in Action

LIEUTENANT-COLONEL R. P. CAMPBELL, C.A.M.C.
LIEUTENANT E. H. M. MCVICKER, R.A.M.C.

Died on Service

LIEUTENANT T. W. F. MCKNIGHT, R.A.M.C., who died at Bombay on September 4th, from pyrexia, was the son of Mr. John McKnight of Everett, Ontario, and was born near Tamworth. He was a graduate of Queen's University where he took his B.A. in 1910 and his medical degree in 1912. He also passed the examinations of the Medical Council of Canada, and received the degree of L.M.C.C. He was in practice at Everett until last April when he joined the Royal Army Medical Corps and in June was assigned to duty in the military hospital at Bombay.

Wounded

CAPTAIN RICHARD COATSWORTH, R.A.M.C.
CAPTAIN W. LAURENCE, C.A.M.C., of Wittemore, Chicago.
CAPTAIN RICHARD COATSWORTH, R.A.M.C.
CAPTAIN BURNETT E. KELLY, C.A.M.C., of Budgenorth, Ontario.
CAPTAIN HOWARD B. JEFFS, C.A.M.C., of Toronto.

Wounded, but remaining on duty:

CAPTAIN EDWARD S. JEFFREY, C.A.M.C., of Toronto.

Medical Societies

CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS

The fifteenth annual meeting of the Canadian Association for the Prevention of Tuberculosis was held in the Hôtel de Ville, Quebec, on September 12th and 13th, under the presidency of Senator J. W. Daniel, M.D., of St. John, New Brunswick.

The delegates were the guests of the city of Quebec, and their stay in the ancient capital of Canada was made most pleasant by the many attentions showered upon them by the citizens, and particularly the medical profession of the city.

The principal subjects discussed on the first day were, "Why notification of tuberculosis is necessary," and "Reasons why open cases should be isolated," opened by Drs. P. H. Bryce and J. H. Holbrook.

At the evening session an official address of welcome was delivered by His Honour Sir Evariste Leblanc, Lieutenant-Governor of the Province of Quebec, whose earnest words bespoke his hearty sympathy with the work of the Association. It was his first opportunity to speak in public since the disaster when ten men lost their lives in the fall of the central span of the great Quebec Bridge, and he took advantage of the occasion to extend his deepest sympathy to the families of those carried down with the enormous structure.

The public address on Tuberculosis was given by Professor J. E. Dubé, of Montreal, who gave a most excellent exposition of the present status of knowledge of the disease and of the practical methods of application of means of prevention.

Dr. David Townsend, of the Jordan Memorial Sanitorium, River Glade, New Brunswick, gave a paper in which he presented an earnest plea for the early diagnosis of tuberculosis as the great factor in securing permanent results in treatment

Professor Arthur Rousseau, M.D., of Laval University, presented an interesting paper upon the place of the dispensary in the anti-tuberculosis campaign, in which he emphasized his opin-

ion that every general hospital should have its tuberculosis clinic which, with its visiting nurse, would prove a most useful adjunct in the discovery of open cases, and would soon lessen the number of cases of infection.

Dr. F. C. Neal, of Peterborough, in an excellent paper, outlined the methods of anti-tuberculosis work in a large town, particularly as developed in his own city. He paid a tribute to the work of the visiting nurse, and indicated how the Peterborough organization had secured the coöperation of the citizens and of the Health Department. The paper is a valuable one which should be of great service as a guide to the development of similar anti-tuberculosis measures in other towns. It will appear in full in a later issue of the JOURNAL.

At the close of the meetings the joint sessions of the Canadian Public Health Association and the Services Sanitaires de la Province de Quebec began and continued two days.

Among those present from Ontario were: Dr. Charles D. Parfitt, Gravenhurst; Dr. R. W. Bell, Dr. Adam Wright, Toronto; Major J. W. S. McCullough, Captain Fitzgerald, Camp Borden; Dr. Helen MacMurchy, Ex-Controller McCarthy, F. A. Dallyn, C.E., Dr. Naylor, Dr. J. H. Elliott, Toronto; Dr. F. Montizambert, Dr. P. H. Bryce, Dr. Race, Sir James Grant, Dr. S. H. Holbrook, Hamilton; Dr. F. C. Neal, Peterborough. Much of the success of the meeting was due to the untiring efforts of the energetic secrerary, Dr. George D. Porter.

At the close of the last session on Wednesday, the delegates were motored to Kent House, Montmorency Falls, to a luncheon as guests of the Municipal Council. It was a delightful day, the roads were at their best and all had a glorious view of the wonderful waterfall where the water drops a sheer 280 feet into the St. Lawrence below. All have carried away most excellent memories of the days spent in and about the city founded by Champlain.

FIFTEENTH ANNUAL REPORT OF THE EXECUTIVE COUNCIL OF THE CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS

THE fifteenth annual convention of the Canadian Association which was to have been held in Vancouver last year, was reluctantly postponed owing to the outbreak of war and the consequent departure of a number of our most active members. Our Association,

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Read by the secretary, Dr. G. D. Porter.

however, published its Annual Report in both French and English. This is a volume of 250 pages, comprising the reports from the various local Societies, reports of the Secretary and Treasurer, revised directories, and other useful information, and over ten-thousand copies have been distributed.

In reviewing the work of the past year it is encouraging to note that in spite of the war and its many drawbacks, very considerable progress has been made. Practically all the institutions have been progressing steadily. During the year no less than five new institutions have been opened, four have been enlarged, and the building of another has already begun.

This year there has been organized in Toronto the Hospital Tuberculosis Clinics, in which four hospitals have united in co-operation with the Board of Health for tuberculosis work entirely. While in some districts economy called for the dismissal of the visiting nurse, in other parts more have been added to the staff of those already doing anti-tuberculosis and general health work. In Toronto the Medical School Inspectors examine for tuberculosis all children having a history of exposure; the Board of Education has established two Forest Schools for delicate children in the summer, and two open-air class rooms for use in the winter have been opened. These children are not a menace to others, but when suffering from open tuberculosis they are excluded from school and sent to the Queen Mary Hospital at Weston for tuberculous children, or visited in their homes by the city Board of Health nurses.

Among the new institutions opened during the year the St. John Hospital for advanced cases is of prime importance as is the new Municipal temporary hospital in the city of Quebec, for the proper care of the advanced cases is one of the most necessary steps to be taken in the prevention of the spread of tuberculosis.

We are pleased to note that the Prince Edward Island Sanatorium and the Waterloo County Sanatorium have both been completed and are now ready for patients. Two private sanatoria have been opened, the Calydor, at Gravenhurst, Muskoka, which should prove most useful in showing that tuberculosis can be properly treated in Canada without the waste of energy and money too often expended in long and distant travel in a foreign land; and the Sunnyview, at Kamloops, British Columbia. The King Edward Sanatorium at Tranquille, British Columbia, is adding a pavilion. The Minnewaska Sanatorium at Gravenhurst has been enlarged to double its former capacity for the special purpose of looking after returned tuberculous soldiers. The

Muskoka Free Hospital has also added two pavilions for the same purpose, and the Sanatorium at Brantford has added a new pavilion. The Laurentian Sanatorium has arranged for an increased bed capacity, especially for returned soldiers, and the work on the new hospital for advanced cases in Hamilton is nearing completion.

In 1908 there were only 250 special beds for patients suffering from tuberculosis available in all Canada. In 1911 there were 900, while now we have 2,000 among the various special hospitals and sanatoria throughout the Dominion. The necessity for this increase, which is as yet far from sufficient, is most apparent, and as the number of returned soldiers who have developed tuberculosis at the front are added to the number already with us, the need for accommodation will be still greater.

Interest in the more chronic diseases, such as tuberculosis, will naturally give place for a time to a greater attention to those more acute infections, such as typhoid, typhus, dysentery, tetanus and septicæmia, which are always threatening our armies in the field and in the trenches. It must be borne in mind, however, that the soldier's very strenuous life, with its hard campaigns and prolonged exposures, to say nothing of the injurious effect of inhaling noxious German gases, will inevitably leave many of them in just that physical condition so favourable to the inroads of tuberculosis. Colonel Primrose has already reported from the front that in a large percentage of the cases examined, which proved to be tuberculous, it was obvious that an active condition had been engrafted upon a healed lesion. "It is not surprising," he says, "that there is danger of pulmonary tuberculosis developing in those who are predisposed thereto."

The measures of relief instituted in the past will, therefore, be most useful for the future when we may look for a larger number of tubercular cases amongst us than we have had before. This has already been demonstrated by reports from Switzerland where it is said "twenty-five hundred tuberculous prisoners will shortly arrive from belligerent countries for special treatment." In France they are also providing pavilions on hospital grounds for the tuberculous soldiers, while in Canada an increasing number of returned soldiers are being received into our institutions because of affections of the lungs.

While sanatorium treatment of tuberculosis is to be advised for all those who can possibly avail themselves of the advantages which it offers, it must not be supposed that the disease cannot be successfully treated in the home, provided ordinary comfort and

the necessary care are there procurable. For those who are compelled to remain at home education, as well as medical care and nursing, is required. This work of education must always continue, for without creating an intelligent interest in the public mind, and securing general coöperation, no permanent improvement can take place. This of course, is the work for which our Association was organized and for which it now labours.

It may be interesting to quote from one or two recent editorials regarding our work. *The British Journal of Tuberculosis* for July says: "At a time when Canadians are accomplishing great deeds for the protection of the Empire, it might be well to remember that in no other part of our overseas Dominions has the Anti-tuberculosis Campaign been more efficiently conducted." An editorial from *Printer and Publisher* calls attention to our report and says that it offers suggestive material to editors throughout the country for reading material for the public, and concludes with the following statement: "If the Government of Canada finds it worth while, on the score of economics and humanity, to grant ten thousand dollars a year to the work of fighting consumption, then local newspapers will also find it worth while to devote some attention to the cost of tuberculosis to the communities in money, happiness and morals." A large number of other Canadian editorials during the past year have also called attention to the importance of the work of this Association.

At the last annual convention of the Canadian Public Health Association a resolution to the Prime Minister was passed in which the following occurred: "We wish to place on record our appreciation of the work of the Canadian Association for the Prevention of Tuberculosis, which your Government has so ably assisted. Since its formation you will be pleased to learn that tuberculosis has been materially lessened in Canada."

As the Red Cross activities have recently been largely monopolizing the energies of those upon whom we particularly depend for advancing the anti-tuberculosis work, it was felt that a number of engagements for lectures and organization work, previously arranged for, were better postponed for a time, and this part of our work has suffered temporarily in consequence. A number of lectures were delivered, however, and the subject of tuberculosis and its prevention has been placed, by request, before a number of important educational institutions during the year. In connexion with lectures it might be well to point out that while our Association was the first in this field, and for a time the only organization doing this work, now there are others, and the office of this Association

is constantly receiving requests for material for lectures from local doctors, nurses, social workers and the clergy; thus we are always supplying the ammunition, if not actually on the firing line. This work, therefore, is now much more extensive than ever before. The demand for our literature is steadily on the increase. During the past year we have, as already mentioned, published our Annual Report in English and in French, and have already distributed over 10,000 copies. We have distributed some 10,000 copies of our pamphlets on ventilation, about 2,000 reprints, 1,000 books on treatment and over 100,000 leaflets. The requests for literature come from the most obscure country districts as well as from public libraries and social workers all over the country. Over sixty public libraries in the United States have requested copies of our reports.

Among the various requests for information addressed to this office were letters from the military authorities in the Second Division regarding sanatorium accommodation in Canada. One came from the International Harvester Company, of Chicago, along the same lines in connexion with the placing of their Canadian workmen afflicted with tuberculosis. From the University of Denver we received a request for a complete set of our literature for the Health and Welfare Exhibit; a similar request from the Provincial Health Officer of Nova Scotia for exhibits there; requests for literature for the newly organized Association of Tuberculosis Clinics in Toronto, and for parcels of literature from organizations in different parts of the country.

Our Association has frequently received requests for some form of tuberculosis exhibits to be used in instructing school children, or to be used at health lectures, at county fairs, and at various educational conventions. We have, therefore, decided to prepare a number of duplicate sets of these exhibits which can be placed in small parcels and sent wherever requested. These should prove of great assistance in teaching this important subject, and also add greatly to its interest. Such exhibits will do away with the necessity of lantern slides which cannot always be used conveniently. These exhibits will consist of maps, charts, statistics and photographs helpful in explaining the disease, its prevalence and methods of prevention, and as we hope to have them arranged and catalogued, so that a layman can easily understand and explain them, they should prove a great advance in our educational work.

We regret to record the death this year of Dr. Bruce Smith, Inspector of Hospitals for Ontario, and for many years one of the active members of our Executive Council, and one whose public addresses and endeavours along educational lines have always been

so helpful. One of his latest reports dwells very clearly upon the necessity for proper housing in the eradication of tuberculosis.

"In our fight against this disease, we must not forget, as Dr. Hattie has pointed out in the *Nova Scotia Health Bulletin*, "That we are yielding up to it a sacrifice of life which far surpasses that which has as yet been required of us in the war zone, and which is not at all likely to be exceeded by our participation in the great struggle for the liberty of nations. There must, of course, be no relaxation of our effort to bring the War to a successful issue, but we must not entirely neglect this other foe, which is so steadily and constantly depleting our population and preventing us from properly developing our resources."

CANADIAN PUBLIC HEALTH ASSOCIATION

The fifth annual congress of the Canadian Public Health Association was held jointly with the Canadian Association for the Prevention of Tuberculosis and the "Services Sanitaires de la Province de Quebec" in Quebec on September 13th and 14th last. There was a very representative attendance of those interested in Public Health, from various parts of the Dominion. Those attending the congress were most hospitably entertained by the provincial and civic authorities.

Owing to the regrettable illness of Dr. Charles J. Hastings of Toronto, president of the Congress, the meetings were presided over by Dr. J. D. Pagé, the president-elect for 1916-1917. The meetings were well attended, representatives from the various provinces being present.

Amongst the interesting items on the programme, was a symposium on Immigration in which Dr. C. K. Clarke of Toronto, Dr. J. D. Pagé of Quebec, Mr. J. D. Woodsworth of Regina, Mr. J. S. Shaver of Fort William and Dr. M. M. Seymour of Regina read papers. The discussion was led by Dr. F. Montizambert of Ottawa, Dr. P. H. Bryce of Ottawa, Dr. W. H. Hattie of Halifax, Dr. Helen McMurchy of Toronto and others.

At the evening sessions held in Laval University papers were read by Dr. Michael Steele of South Perth on "A Federal Department of Health," by Sir James Grant of Ottawa on "Carriers of disease" and by Dr. Arthur Vallee of Quebec on "De l'influence de la bactériologie sur les developpements de l'hygiène moderne," and by Ex-Controller McCarthy of Toronto on "Economic values of preventive medicine."

In the absence of Dr. Hastings the presidential address was

read by Dr. P. H. Bryce of Ottawa. Other communications were read, as follows: "Social investigations in relation to public health," by Madame Gerin-Lajoie of Montreal; "Value of milk depots," by Madame Jules Tessier, Quebec; "Modern sanitation in camp," by Major J. W. S. McCullough, Toronto; "The occurrence of certain types of B. coli in come waters of the province, and their sanitary significance," by Mr. H. H. McCrady of Montreal, "Activated sludge treatment of sewage," by Mr. W. H. Clarke, of Lawrence, Massachusetts, and a paper by Dr. J. G. Fitzgerald on "The work of the Antitoxin Laboratory of the University of Toronto."

Addresses of welcome were made by Sir Lomer Gouin and His Worship the Mayor of Quebec.

Resolutions were adopted urging the establishment of a Federal Department of Public Health and pointing out the desirability of the adoption by the various provinces of the Model Draft Act on Town Planning, prepared by Mr. Thomas Adams of the Commission of Conservation, Ottawa. The next Annual Congress is to be held in Ottawa in 1917.

The election of officers resulted as follows:

Patron, Field Marshal His Royal Highness the Governor-General.

Vice-Patron, Rt. Hon. Sir R. L. Borden, P.C., M.P., G.C.V.O., Premier.

Past Honorary Presidents and Honorary Vice-Presidents: Sir Edmund Osler, Sir James A. Grant, Hon. A. L. Sifton, Hon. J. M. Methuen, Rt. Hon. Sir Wilfrid Laurier, Hon. W. Scott, Hon. Sir Sam Hughes, Hon. Martin Burrell, Sir John Eaton, Hon. W. J. Hanna, Dr. P. H. Bryce, Sir Clifford Sifton, Hon. T. C. Norris, Hon. G. H. Murray, E. R. Woods, Esq., Hon. Sir. R. McBride, Hon. H. K. Fleming, Hon. Sir Lomer Gouin, Hon. J. D. Hazen, Hon. George Langley, Dr. Adam H. Wright, Hon. R. G. Brett, M.D.

Honorary President: F. Montizambert, Esq., M.D., C.M.G.

President, J. D. Pagé, Esq., M.D., Quebec.

Vice-President: W. H. Hattie, Esq., M.D., Halifax, N.S.

Vice-Presidents: Dr. J. A. Hutchinson, Quebec; Dr. Underhill, British Columbia.

General Secretary: J. G. Fitzgerald, M.B., Toronto.

Treasurer: George D. Porter, M.B., Toronto.

Executive Council: T. A. Starkey, M.D., D.P.H., past president, Montreal; Charles H. Hodgetts, M.D., D.P.H., past presi-

dent, Ottawa; J. W. S. McCullough, M.D., D.P.H., past president, Toronto; M. M. Seymour, M.D., D.P.H., past president, Regina; C. J. Hastings, M.D., Toronto; E. P. Lachapelle, M.D., Montreal; Dr. F. Torrance, B.A., D.V.S., Ottawa; Dr. H. Stewart, Ninette, Man.; Miss Eunice Dyke, Toronto; Gen. C. G. Jones, G.G.H.S., D.G.M.S., Ottawa; H. W. Hill, M.D., D.P.H., London; John Stewart, M.D., LL.D., Halifax; S. L. Walker, M.D., Truro; S. R. Jenkins, M.D., Charlottetown; Dr. P. J. Maloney, Cornwall; Dr. S. Boucher, Montreal; F. F. Westbrook, M.D., Vancouver; Dr. Arthur, Nelson, B.C.; W. C. Laidlaw, M.D., Edmonton; Mrs. A. M. Huestis, Toronto; Mrs. J. C. McLimont, Quebec; Miss Helen R. Y. Reid, Montreal; W. W. Andrews, LL.D., Regina; J. B. Hollingsworth, D.V.S., Ottawa; Hon. Senator Daniels, St. John, N.B.; Dr. Helen MacMurchy, Toronto; A. Simard, M.D., Quebec; Hon. Dr. Young, Victoria; Dr. Johnson, Charlottetown; Dr. Nadeau, Quebec; Dr. G. G. Melvin, St. John, N.B.; Dr. Clarence Miller, Stellarton, N.S.; Dr. T. J. Norman, Edmonton; Dr. Anderson, Toronto; Hon. J. A. Calder, Regina; F. A. Dallyn, C.E., Toronto; T. A. Murray, Toronto; Dr. A. B. Alexander, Winnipeg; Mrs. J. Tessier, Quebec.

SANITARY SERVICES OF THE PROVINCE OF QUEBEC

The sixth annual meeting of the Sanitary Services of the Province of Quebec took place at Quebec on the 12th, 13th and 14th of September, under the presidency of the Honourable Senator J. B. R. Fiset, M.D., of Rimouski. The meeting opened with an able address by the President. The papers presented treated of a number of important problems of public health and in many cases led to interesting discussions. The report of the Committee on Venereal Disease was read by Dr. P. V. Faucher, of Laval University and Dr. A. Corsin presented the report of the Committee on Infant Mortality. The question of the medical inspection of schools was taken up by Dr. Arthur Simard, as chairman of the Committee appointed to study the matter. Dr. J. A. Beaudouin, medical officer of health, Lachine, also dealt with this matter, emphasizing the advantages of such inspection. The officers elected for the year 1916-17 are: honorary president, Hon. Senator Fiset, M.D., Rimouski; president, Dr. Arthur Simard, Quebec; vice-president, Dr. J. A. Hutchinson, Westmount; secretary, Dr. J. A. Beaudouin, Lachine. The next convention will take place at Rimouski.

SASKATCHEWAN MEDICAL ASSOCIATION

THE ninth annual meeting of the Saskatchewan Medical Association, which took place at Regina on July 18th and 19th, was one of the most successful gatherings of the Association, sixty-two members being in attendance. The presidential address was delivered by Dr. George P. Bawden, of Moose Jaw. A number of interesting papers were read, two of them being of particular interest at this time, namely, that by Dr. Myers, of Saskatoon, on "The returned disabled soldier" and one by Dr. Valens, also of Saskatoon, entitled "Some matters relating to the medical profession." Speaking of the problem of providing for the disabled soldier on his return to Canada, Dr. Myers said that the solution of this problem should not be left entirely to the Military Hospitals Commission but each individual should undertake his share of the responsibility. The provision of medical treatment was essentially a matter for the medical profession to deal with. Up to July 13th, 1916, 236 disabled soldiers had returned to the province of Saskatchewan and of these 150 required further medical treatment. Dr. Myers suggested that, whevever possible, crippled soldiers should return to their former employer—perhaps in some new capacity—and should not be segregated or gathered in large colonies. New industries should be established to provide employment for these men and goods manufactured by them should be labelled "returned soldier". Occupations in the open, such as market gardening and poultry raising, should be made available for those suffering from arrested tuberculosis and nervous diseases, and small sheep ranches might be established on land given by the government, the money for the purchase of the flock to be advanced. He suggested also that a census be taken of all employers of labour in the province and of positions that are or could be made available in the various services of the government. The state, he thought, might even stipulate when awarding contracts to civil concerns that a proportion of the work be given to war cripples. This paper was well received and later at the business session the following resolutions were passed:

> "Resolved, that it is the sense of the Association in session that the government conduct a census of all available positions of employment within its service and among the employers of labour in the province, with a view to employment of disabled and unfit returned soldiers."
>
> "Also that the Saskatchewan Medical Association feel constrained to offer their services to the government for use in the solution of these problems in whatever way the government may see fit."

Dr. Valens chose as the subject of his remarks the provision of adequate medical attendance and nursing care for the inhabitants of the outlying districts of the province. This is a matter that has been under discussion for some time and is one of extreme importance. A committee was appointed to gather information as to the actual conditions, to confer with representatives of other bodies interested in the question, and to report to the Association.

At the business session the following resolution was passed:

> "Be it resolved, that this Association believes that the perpetuation of the Council of the College of Physicians and Surgeons of Saskatchewan beyond its proper term of office is not conducive to the best interests of the medical profession in the province, nor to the members overseas with the colours, and that an election should be held immediately, and that due and ample notification of such election be made to the members of the College with proper statement of dues in arrears, and that a copy of this resolution be forwarded to the Council."

The next annual meeting of the Association will be held in Saskatoon on the third Tuesday of July, 1917. The officers for the session 1916-1917 are: honorary president, Dr. F. A. Corbett, Regina; president, Dr. R. H. Love, Saskatoon; first vice-president, Dr. D. W. Graham, Swift Current; second vice-president, Dr. G. F. Cliff, Mortlack; permanent secretary-treasurer, Dr. J. W. Turnbull, Regina.

PRINCE EDWARD ISLAND MEDICAL SOCIETY

The annual meeting of the Prince Edward Island Medical Society took place at Charlottetown on July 11th, the president, Dr. Carruthers, in the chair. A report was presented by the committee appointed to revise the scale of medical fees and was adopted. Papers were read by Dr. Risden, of Toronto, Dr. Carruthers, Dr. McMillan, Dr. Tanton, and Dr. Warburton. The election of officers resulted as follows: president, Dr. R. J. MacDonald, of St. Peter's; vice-presidents, Dr. McPhee, of Summerside, Dr. Dewar, of Charlottetown and Dr. A. A. McDonald, of Souris; secretary, Dr. Yeo (re-elected); treasurer, Dr. McMillan (re-elected); executive committee, Dr. John McNeill, Dr. Conroy, and Dr. McIntyre. The next annual meeting will be held at Summerside.

THE MONTREAL MEDICO-CHIRURGICAL SOCIETY

The thirteenth regular meeting was held in the Royal Victoria Hospital, on Friday evening, April 7th, 1916. On this occasion the Society was the guest of the Hospital Medical Board, which submitted the following highly interesting programme:

Part I. A.—Informal Presentation of Living Cases in Ward "A":

Dr. Armstrong—(*a*) Carcinoma of the œsophagus (with Dr. Rogers). (*b*) Obstruction; entero-enterostomy; resection of the bowel; lateral anastomosis. (*c*) Intestinal obstruction; drainage.

Dr. Ballon—(*a*) Zygomatic abscess in infant; (*b*) Chronic suppurative otitis media c. labyrinthine fistula (right); acute suppurative mastoiditis c. facial paralysis (left); (*c*) Bezold's abscess with facial paralysis.

Dr. Burère with Dr. Mason—Series of skin cases.

Dr. Byers—(*a*) Needling for high myopia; result after ten years; (*b*) Elliot and Herbert operations for glaucoma; special features; (*c*) Convergent strabismus; double advancement; special features.

Dr. Chipman—(*a*) Post operative hernia with escape of bowel; re-suture of wall with recovery; (*b*) Puerperal bacteræmia; chart illustrating the use of eusol.

Dr. Fry—(*a*) Cranio-tabes in breast-fed infant; (*b*) Tuberculous ganglia of wrist in two-year-old child.

Dr. Garrow—(*a*) Extensive ulceration of the abdomen, following gangrenous appendicitis. Wassermann test negative; (*b*) Gunshot wound of the humerus, with destruction of a part of the musculo-spiral nerve; (*c*) Transplantation of part of a rib to replace half of the body of the lower jaw removed for sarcoma; (*d*) Acute pyelo-nephritis (with specimen); (*e*) Intussusception due to lympho-sarcomatous growth involving the ileum, simulating acute appendicitis (with specimen); (*f*) Acute empyema of the gall-bladder complicated by advanced Graves' disease.

Dr. Hamilton—Clinical cases.

Dr. Jamieson—Plastic operation for "saddle" nose.

Dr. Kaufmann—(*a*) Cases showing types of auricular fibrillation; (*b*) Echinococcus disease; (*c*) Mediastinal tumor.

Dr. Levine—Suppurative epididymo-orchitis following typhoid fever (pure cultures).

Dr. Martin—Case of hypopituitarism.

Dr. Moffatt—Heart block during an attack of acute arthritis.

Dr. Morrison—Two cases of pneumothorax.

Dr. Mundie—Friedreich's disease.

Dr. Patterson—Acute suppurative arthritis of hip (secondary); subtrochanteric osteotomy for resulting deformity.

Dr. Rogers—(*a*) Epithelioma of the tonsil; (*b*) Gunshot wound of the larynx.

Dr. Rosenbaum—A case of palpebral syphilis.

Dr. Stirling—Clinical cases.

B.—Demonstration of Equipment, Apparatus, Instruments, Charts, Etc., (Ward "A") as follows:

Dr. Abbott—Haldane apparatus for estimating alveolar air.

Dr. Armstrong—Operating tables; fracture tables; new catgut.

Dr. Byers—(*a*) Gradle—Schiötz tonometer; (*b*) Duane's tangent screen; (*c*) Charts illustrating tuberculin reaction in occular tuberculosis.

Dr. Chipman—(*a*) Therapeutical appliances (electric baths, etc.); (*b*) Percy cautery with speculum; (*c*) Needles for intravenous injection of eusol in puerperal bacteræmia.

Dr. Jamieson—Sluder's instruments for enucleation of the tonsil.

Dr. Levine—Apparatus for blood transfusion.

Dr. Martin—Abdominal belt for enteroptosis.

Dr. Morrison—(*a*) Appliances for venous pressure estimation; (*b*) New, simple apparatus for nitrogen injection.

Dr. Nagle—Anæsthetic apparatus.

Dr. Odland—Lange's colloidal gold test for cerebro-spinal fluid.

Dr. Stirling—(*a*) Corneal microscope; (*b*) Unusual visual fields.

C.—Exhibit of Pathological and Bacteriological Specimens by Drs. Oertel and Bruere.

D.—Radiological Exhibit by Dr. Cheney and Mr. MacNeil.

Part II. Five-Minute Clinics in the Medical Theatre, as follows:

Dr. Martin with Dr. E. H. Mason—On the treatment of diabetes.

Dr. Martin with Dr. C. Thompson—Lantern demonstration of charts of typhoid fever.

Dr. Armstrong—(*a*) Blastomycosis; (*b*) Splenectomy.

Dr. Garrow—(*a*) Acute gangrenous appendicitis complicating pregnancy; (*b*) Salvarsan in the treatment of actinomycosis.

Dr. Peter Brown—Oral anæsthesia.

THE fourteenth regular meeting of the Society was held Friday, April 28th, 1916, Dr. F. A. L. Lockhart, president, in the chair.

CASE REPORTS: 1. Peculiar fœtal malformation, by Dr. David Patrick.

The specimen which I wish to show you to-night is one in which club feet, spina bifida, and hydrocephalus are found together. I understand that a number of such cases have been reported but as this is the first case of the kind I have met with in my practice I thought that it might prove to be of some interest to the members of the Society. The mother of this fœtus was a multipara and this was her fourth labour; the three previous labours were quite normal. I did not see the mother in this case until she was in labour, having been advised of her condition only one week previously. It was a breech presentation and the breech was delivered without difficulty, after which the club feet and spina bifida were discovered. The delivery of the shoulders was not nearly so easy owing to the size of the head and its high situation in the pelvis. It was at this time that the hydrocephalus was first discovered and its delivery found to be impossible. As the child had perished by this time it was thought advisable to puncture the base of the skull, express the fluid from the head by pressure on the abdomen and deliver it by pressure on the abdomen and traction on the shoulders. The only difficulty experienced in performing this operation was lack of room to work as the high situation of the head kept the shoulders drawn tightly against the vulva. For this reason it was impossible to use the ordinary instruments used for this purpose and a long pointed and curved pair of scissors was then directed along the fingers and driven into the base of the skull, the fluid expressed, and the after-coming head delivered.

2. Method of treatment of partial pyloric stenosis, by Dr. C. K. P. Henry.

Cases of pyloric stenosis have been reported before this Society this winter and while I present another case it is with the sole desire to present only a mode of treatment, and that not original. To do this it is necessary to define the cases that are open to non-operative treatment.

It is commonly recognized that there are two classes of pyloric stenosis met with in infancy, one, the hypertrophic congenital pyloric stenosis. This can alone be cured by operation. There is in these cases hypertrophic muscular obstruction and where gastro-enterostomy has been done and an autopsy performed six months later, as in a case in recent literature, the pyloric stenosis still persists. Then there are the cases of pyloric spasm, or non-complete stenosis. Whether due to a degree of hypertrophy or to simple spasm the condition must be overcome, for an infant dead of spasmodic stenosis is every bit as dead as one of hypertrophic stenosis. Holt says the two differ more in degree than kind. Spasm of itself will not lead to hypertrophy but may give in life all the symptoms of true organic stenosis. These cases if not benefitted by proper diet or appropriate treatment, often die. In all cases the indications for operation are: (1) Where the infant weighs 5 to 6 lbs., is puny, and is not improved under treatment in seven to ten days; (2) where loss of weight is rapid, 8–16 oz. a week, and (3) if vomiting persists in spite of treatment.

The passage of the duodenal catheter is simple, easy, and gives prompt results in suitable cases. The catheter is a No. 12 or 13 E scale, soft rubber, preferably of a rather firm body and it is passed with the child flat on the table. Spasm is induced and gagging, as it reaches the cardia, ceases as the catheter enters the stomach and begins again as it enters the pylorus but ceases as the catheter enters the duodenum. On withdrawing the tube the same holds true. It should be passed once or twice a day and serves to empty the dilated stomach and allow of escape of gas. Sometimes it is necessary to put a little sterile water into the stomach to float it along to the pylorus. In most cases the stomach is over full with fluid contents. Bile-coloured fluid is often seen coming from the tube after it has entered the duodenum. As a rule, prompt relief ensues. The gastric dilatation, the projectile vomiting, the constipation and loss of weight are quickly relieved and under proper feeding the child quickly improves.

Case: Baby G., seen October 16th, 1915, aged six weeks. Breast fed to date, doing well until last two weeks, though under weight. Lately has been fretful, constipated, requiring enemas, vomiting after food considerable quantities and often violently. Weighed at birth ten pounds, considerable loss the last two weeks. The mother's breasts were flabby and milk was failing. Allenbury's No. 1 was used to supplement the breast nursing and by October 22nd the child had improved, the bowels moving naturally.

The symptoms returned, however, in a few days, it had a convulsion and the distension of the abdomen, vomiting and constipation returned. On October 30th, operation seemed advisable though no tumour could be felt nor peristalsis seen. On the 31st, I passed a No. 12 E catheter, the stomach was emptied of 3½ oz. of food (eight weeks old) at least two hours after feeding. On November 1st, tube again passed 1½ hours after feeding, stomach empty. Stools to-day were two in number, more yellow. November 2nd, again passed catheter 1½ hours after food but nothing withdrawn. Baby cries less, distension less, no vomiting, sleeps better, weighs 7¾ lbs. November 15th, weight is now 8½ lbs., no vomiting, stools natural. The daily use of the catheter was continued for one week, then every second day for one week. On December 6th, the child was doing well on artificial food alone and was gaining steadily. It was seen again on February 17th, when it could not be recognized as the same baby; it was plump and well. My case notes read: "The appearance of the child has wonderfully changed, he is fat and has a double chin." Since then he has gone through an attack of pneumonia. His weight was 17½ lbs., March 15th, at 6½ months.

PAPER: The paper of the evening wes delivered by Dr. F. W. Gilday who took as his subject "Hip joint disease."

DISCUSSION: Dr. J. Appleton Nutter: I have enjoyed Dr. Gilday's talk very much indeed and I would ask if I may add to his list of differential diagnoses the acute onset of infantile paralysis. A case recently came from Haileybury where two or three of us could not at first make up our minds as to which it was. In the case of early onset of a mild grade there is so much pain and tenderness that the patient will not use or move his leg but in the course of a week or two if there is paralysis it will show up. It is perfectly weird how these two conditions may be confused at first. In Perthes' disease, which by the way Legge, of Boston, described over two years before Perthes did, the *x*-ray can usually be depended upon to differentiate pretty clearly at the outset. Perthes' disease shows very easily within a month or six weeks the breaking up and flattening of the epiphysis, so much so that it is often called flat top femur.

Dr Gilday spoke of limitation of motion as a characteristic sign of hip disease. We must remember that, in the case of a boy who may have fallen out of a tree and injured his hip we may have limitation of motion and may have this weeks and weeks after the accident and yet not have hip disease. What happens is that epiphyseal separation at the hip often occurs in a child and there

the characteristic thing to remember is that you may get a difference in measurement. Besides this, in the epiphyseal injury you will get limitation of motion in some directions and not at all in others, whereas in the tuberculous joint you will get it slight but unmistakable in all directions.

Dr. G. G. Campbell: I would like to enter a strong protest against the modern tendency to class all forms of rheumatism as one. Acute rheumatic fever differs from an arthritis arising from any other form of infection. It seems to me that if there is one disease that is perfectly definite in its course and symptoms and stands out in such a way that there is no possibility of mistake it is acute rheumatic fever. In this form of arthritis the tenderness of the joint is so acute that the mere slamming of a door makes the patient cry out, and yet in twenty-four hours all joint symptoms may disappear absolutely and a week later one is unable to tell that any inflammatory condition had been present. In no form of septic infection is that possible. Rheumatoid arthritis also is to my mind a definite disease but what the cause of it is I do not know, it may possibly, like one of the most common forms of arthritis—gonorrhœal, be due to some septic germ. Hence I feel that we should not classify all forms of arthritis as septic in origin.

Dr. A. G. Morphy: There are certain cases in adults in which possibly some difficulty may arise in diagnosis, especially if one relies upon clinical diagnosis alone without the *x*-ray. A couple of weeks ago a man came to the clinic complaining of good deal of pain in the back and leg. On the examining table there was a good deal of tenderness and pain over the sacro-iliac joint and in the usual places where we look for tender points in these conditions, i.e., over the site of the sciatic nerve; but he had also spasm of the muscles that control the hip joint. Now that case suggests a considerable difficulty in the matter of diagnosis and I would say that in such a case as this that the sacro-iliac joint should be very thoroughly investigated.

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PRESIDENTIAL ADDRESS

By T. H. Whitelaw, B.A., M.B., M.O.H.

Edmonton

As President of the Alberta Medical Association it has devolved upon me to address the annual meeting, and while the honour done me is fully appreciated, it is accompanied by a sense of the heavy responsibilities involved in an attempt to put before you some matters of more than ordinary interest to the profession.

It was only after careful consideration that it was decided to hold this meeting this year. Notwithstanding the absence of many of our members who have gone overseas, it was thought it would be a mistake to postpone the meeting, even though the attendance must necessarily be greatly reduced. From returns received it appears that in 1915 eighty-nine medical men of the province were members of the Canadian Medical Association, with which this Association is in affiliation. Membership in the Canadian Medical Association entitles one to membership in the Alberta Association and to the Canadian Medical Association Journal, the official organ of the Association. That only eighty-nine are subscribers to the Journal is not a creditable record for Alberta. It is only by giving the Canadian Medical Association Journal our support that it can become a journal worthy of the Canadian medical profession and the equal of the longer-established journals published in Britain and the United States. With more generous support it would shortly become a weekly journal and so valuable and interesting that no progressive Canadian practitioner would wish to do without it.

Probably the subject which occupies our minds to the greatest extent at the present time is the great war, forced upon us by the overweening ambition for power and dominion of one of the great-

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est nations of the world, a nation which we of the medical profession have for many years associated with the greatest advancement in scientific and medical education. We have worshipped at the shrine of German achievement in arts, science and medicine, but have learned to our cost that the government of that country has for many years, with fiendish ingenuity, been skilfully directing all the ability and energy of its scientific men of all professions into the one all-important channel, that of promoting efficiency in the art of waging offensive warfare, to the end that the doctrine of might over right, instituted by Frederick the Great, might become an accomplished fact, and that liberty and the freedom of nations might be subjected to the dominance of German kultur. In other words, all the scientific genius of the nation has been dedicated to the art of destroying human life.

How nearly the German autocracy came towards accomplishing this nefarious design through the power of organization and secret preparedness of the great war machine is now a matter of history.

This attempt at world domination has been frustrated only through calling out the resources of our whole Empire, which, though woefully unprepared and unorganized, except for the navy, has settled down to the task of assisting our Allies with all the innate determination and bull dog tenacity of the British character.

Where all branches of the service have done their duty so well, it might be invidious to particularize, but I may be pardoned if I refer briefly to the splendid work of the medical service, which has done much to raise the status of the medical profession to heights never before reached in the world's history. It cannot be denied that without the efficient medical service of the allied powers which through experience gained since the war began, has become more and more successful in the prevention of disease and the treatment of the wounded and sick, we should certainly have been long since defeated by our enemies who, especially in the case of Germany, had neglected nothing in preparedness to cope successfully with disease, sickness and wounds.

At the beginning of the war it was estimated that the efficiency of the army was increased by one third through the work of the sanitary and medical service, but later estimates have raised this figure to 50 per cent.

An instance of how a military expedition may utterly fail, through lack of proper medical and sanitary supervision, was strikingly illustrated by the ignominious and costly defeat of the ill-fated Walcheren expedition over one hundred years ago, which,

with a loss of over half its strength, was by disease and sickness utterly routed and compelled to retire without having accomplished any military purpose.

Longman's tables, based on the records of the wars of the last one hundred years, show that there has rarely been a conflict of any long duration in which there have not been four deaths from disease to every one from bullets or other lethal weapons.

In the Spanish American war there were fourteen deaths from disease to one from wounds or killed in battle. Of 107,000 troops of the United States engaged over 20,000 contracted typhoid fever in six months, and 1,580 died.

Japan in her war with China in 1894 lost three from disease for every one by wounds or killed in battle, but in her war with Russia in 1904 she had so improved her medical service that only one died of disease for every four lost in battle, and of the total sick only 3·51 per cent. were due to communicable diseases. In an army of 600,000 men there were only 1,257 cases of malaria, whereas in the previous war with China there were 41,734 cases of this disease.

In the present war vaccination has practically eliminated smallpox as a disease among the armies of Britain, France or Germany. In the Franco-German war thousands of French soldiers died of smallpox and only 353 among the better vaccinated German soldiers. The total absence of smallpox in the armies referred to in this present war is due to the strict enforcement of vaccination or the evidence of previous successful vaccination required of all enlisted men.

It is in regard to the prevention of typhoid fever, however, that the most brilliant results are being secured through the general practice of anti-typhoid inoculation. Sir William Osler recently stated that among all the British troops there had been from the outbreak of hostilities to date (June, 1916) only about 1,250 cases of typhoid fever of which 900, or 75 per cent., were uninoculated.

Of the 300 inoculated investigation would show that the great majority were either in the incubation stage of typhoid when inoculated, or were not given the complete treatment, a condition almost inevitable in the early months of the war with the immense number of recruits to deal with in the limited time available.

According to Sir William Osler during the South African War before inoculation was in vogue in our army, there were over 57,000 cases of typhoid fever, of whom 19,454 were invalided and 8,022 died, or slightly more than the total number who succumbed to Boer bullets.

From an official return relating to mortality from typhoid fever issued by Sir Berkeley Moynihan at the beginning of the present year, the following facts are derived. Among the men inoculated once there have been 452 cases of typhoid with twenty-four deaths, a death rate of 5·3 per cent. Among those inoculated twice there have been 215 cases with sixteen deaths or 7 per cent., and among those not inoculated there have been 117 cases with a death rate of 20·6 per cent. Inoculation therefore according to these figures reduces the risk of death to one fourth among those affected, while the risk of contracting the disease is reduced to about one fourteenth of what it would otherwise be. Later returns will no doubt be even more favourable as indicated by the following dispatch, dated August 14th, 1916: "The significant value of inoculation to prevent typhoid is shown by the fact that, despite the heat and battle conditions where burying the dead and sanitary conditions are hard to control, according to the last report there were only seventeen cases in the immense army of France." Not a single case of typhus fever, also called army fever, because of its great prevalence among troops heretofore has been reported on the Western front. In this connexion the special attention given to encouraging personal hygiene among the men is significant. Nothing is left undone by the Sanitary Corps to provide at any cost ample facilities for hot disinfectant baths for the men as they return from duty in the front trenches. They are supplied with clean underclothing and their outer garments are restored to them cleaned and sterilized by heat on emerging from the bath. This not only preserves the self-respect of the men, but protects them against discomfort and disease by destroying the crawling terror incidental to trench life, body lice and vermin now known to be the causative factor in the spread of typhus fever.

The whole story of what medical science is doing in France and Belgium will not be told for some time yet, but the few items of news that reach us serve to show that disease of an infectious nature even under the worst possible conditions, without the comforts and conveniences of civilian life, can be kept under control if regulations for its prevention are thoroughly carried out. It is only under the conditions of iron discipline, maintained by military law, guided by sanitary expert opinion, that such results can be achieved. In civilian life the boasted liberty of the subject is always invoked to a greater or lesser degree to interfere with the strict enforcement of sanitary laws and prevention of disease. It is almost inconceivable that during the first year of the war, a determined effort

was made by fanatical and ignorant civilians in Great Britain, chiefly members of anti-vaccination societies, to prejudice the minds of our soldiers against inoculation for typhoid fever and that the opinion of experts, among others Sir William Osler, had to be published and fully advertised to controvert and rebuke this insidious campaign. Dean Inge, of St. Paul's, London, England, did not state the case too strongly when he said he would, if he were at the head of affairs, shoot those responsible for this disgraceful and unpatriotic agitation. Even in Canada some opposition developed to anti-typhoid inoculation, the Toronto *Globe*, one of our most influential and prominent newspapers publishing in August of 1914 an editorial objecting to and criticising the use of the remedy on the members of the First Canadian Contingent.

The experience gained since the war began has brought about improvement in the inoculation method of preventing typhoid fever. I am informed that the serum now used protects the individual against para-typhoid A and B also. To guard against tetanus, anti-tetanic serum is used as early as possible in all cases of wounded men before reaching the base hospital, with the most satisfactory results.

No cholera has appeared on the Western front, and only a few cases in the Southeastern field. The Army Medical Corps are fully prepared to deal with it, if it appears, by means of anti-cholera serum. A few cases of bilharzia hæmatobia have occurred.

According to Captain J. G. M. Sloane, one of our well-known Edmonton physicians who is in army service work on the Salonica front, bacilliary dysentery is treated there by intravenous injections of serum and amœbic dysentery by injections of emetine.

Out of the welter of this terrible war, with all its misery and suffering, will emerge as some small measure of compensation a fuller knowledge of the prevention of disease, the treatment and cure of sickness and wounds and general surgical conditions, which knowledge will be used by the medical profession to the great benefit of living humanity and generations yet unborn.

One curious result of the war among the civil population is the marked lessening in the number of cases of hysteria, insanity, and other neurotic affections, due apparently to the fact that habits of introspection and concentration of the individual on private and personal affairs, have given way to, and been absorbed by public necessity and service.

While the Province of Alberta has responded nobly to the call of patriotism and has enlisted more than its due proportion of men

in the Canadian Army, the medical profession of Alberta has done even better. It is difficult to obtain with accuracy the number of medical men who have given up active practice for military life, but it is probably a low estimate to state that at least one third of the medical men in Alberta have already taken this step. Considerably more than this proportion have gone from the cities of Calgary and Edmonton. From the city of Edmonton alone forty-two medical practitioners have gone into the medical service, from the ranks of active practitioners numbering one hundred and eighteen. From Calgary forty-five out of one hundred medical men have gone to the front. One of our brightest and most brilliant Alberta practitioners, a member of this Association, has made the supreme sacrifice. I refer to Captain Monkman, of Vegreville, who was killed in action December 2nd, 1915.

It is with pride and satisfaction that we, who for various reasons have been unable to respond in an active way to our country's call, realize that our profession is so well represented at the front. We have confidence that they who have gone will do honour to themselves and to the profession, and when they return, which we trust will not be at any very remote date, they will be received with the full appreciation and respect of their medical confrères and the community generally, which is the just reward of their self-sacrifice in the cause of suffering humanity. They will come back with higher ideals, if possible; a richer and more valuable experience, and be better fitted to resume once more as civilians their professional careers.

Since our last meeting our Association has been honoured by the elevation to the position of Lieutenant-Governor of the province of one of its most active and prominent members, the first time I believe in the history of Canada that a member of the medical profession has been called upon to fill so important a position. It was with pride and satisfaction that we learned that the first citizen of our province was to be our friend and confrère, Dr. R. G. Brett, of Banff, and it is only the simple truth to say that he is filling the position with that urbanity, geniality, distinction and credit which was naturally expected of him by the members of his profession.

It seems fitting also to refer to another veteran practitioner of our province, the late Dr. H. G. Mackid, the news of whose death recently was received with regret throughout the whole province. Dr. Mackid was one of our pioneer physicians, a brilliant surgeon, and during his career took an active interest in all matters relating

to his profession. He was president of the Alberta Medical Association for 1911, and president of the Canadian Medical Association for 1912 at the largely attended meeting held in Edmonton.

Before concluding this paper it may not be inappropriate to refer briefly to several matters of public importance in which the medical profession is specially interested.

The question of providing more efficiently for the care and treatment during illness or accident of residents of the outlying districts of our Province remote from hospital centres, has become a matter of vital importance which can no longer be ignored and while there may be many difficulties to be overcome before a satisfactory solution can be worked out, it is the duty of the medical men of this province to assist by their counsel and advice the movement for providing hospital facilities within a reasonable distance of every settler in the province. A Free Public Hospitals' League has recently been started in Calgary and is actively engaged in a campaign with this object in view.

Another matter which is of supreme importance to the future welfare of our province is the necessity of providing a Provincial Sanitarium for the treatment and care of tuberculosis. Alberta is at present the only province in the Dominion which has made no progress in this direction, though the Dominion Government has made a grant of land west of Calgary on which it is proposed to erect a sanitarium. A Provincial Anti-Tuberculosis Association has been formed but since the war began it has not been deemed advisable to carry out the campaign arranged for, towards securing this much needed institution.

The war must and will end within two years and following its ending our soldiers will be returning to civil life, and it is certain that a proportion of them will return broken in health and in some cases in a more or less advanced stage of tuberculosis. These added to our normal percentage of cases, will emphasize the need of such an institution in our province in a very special manner. Is it not the duty, or rather the privilege of this community, the Provincial Government and the Federal Government individually and collectively, to see to it at once that no returned soldier lacks anything which can be provided to assist him to regain his health and usefulness to the community? Sanitarium treatment not only gives the best possible chance of recovery but removes from the community a potential source of infection to others.*

* Since this paragraph was written the Medical Hospitals' Commission has opened a sanitarium for tubercular soldiers at Frank, Alberta.

The association of medical men from all parts of the Empire in the Army Medical Corps since the war began, has brought prominently forward the advisability or necessity of medical reciprocity throughout the Empire, so that a good medical degree will entitle the holder to practise in any part of the British Empire. It seems probable that as one of the results of the great war, this desirable consummation will be reached at a much earlier date than would have been the case otherwise. This matter will be dealt with at the afternoon session of the Association to-morrow.

In conclusion I desire to call attention to the excellent beginning which has been made by the Faculty of Medicine in the University of Alberta. The attendance of students in this branch has, just as in other departments, been greatly curtailed by enlistment for active service, almost fifty per cent. of the first, second and third year medical students having gone with the ambulance corps. An inspection of the equipment and facilities provided by the Medical Faculty for the teaching of medicine, more especially of the primary subjects, will indicate that nothing has been omitted which makes for efficiency and the most thorough training in the foundations of a good medical education. The clinical years, fourth and fifth, of the five year course, are given according to arrangement by the Universities of McGill and Toronto, as they have not yet been organized here. I take pleasure in heartily commending this part of the University's work to the good will and material support of the medical profession of the province.

The honour roll of the University including members of the staff now numbers over four hundred, or equivalent to almost the total yearly attendance at the time the war began, a record which is probably not exceeded, if it is equalled, by any other university of Canada, and which reflects the highest credit on the young men of intellectual aspirations in our province. Never before in the history of the world has the medical profession filled so useful and honourable a position as at present. Never before has it had so favourable an opportunity to demonstrate the absolute certainty of preventive measures in curtailing diseases and sickness, and the efficiency of the methods used in treating the wounded and the afflicted. Never before has so much attention been given to the alleviation of human destitution, misery and pain. Let us each strive in our individual capacity by constant study and application, by fair and honourable dealing with our medical confrères and the public generally, to maintain the high and noble traditions of a profession which seeks rather the betterment and uplift of humanity than the mere acquisition of wealth.

SOME OBSERVATIONS ON EPIDEMIC CEREBRO-SPINAL MENINGITIS

By Albert G. Nicholls, M.A., M.D., D.Sc.

Captain, C.A.M.C., Professor of Pathology, Dalhousie University, Halifax.

EPIDEMIC cerebro-spinal meningitis, known also as cerebro-spinal fever, spotted fever, petechial fever, malignant purpuric fever, has again come into the limelight after some years of comparative neglect on the part of clinical biographers. This is due, doubtless, to the fact that since the war outbreaks of the disease have occurred in Canada and Great Britain, in districts where large numbers of people have been concentrated, and under circumstances in which it is of vital moment to the communities concerned that so dangerous a disease should not get out of hand. While the clinical features and morbid phenomena have for long been well understood, it is not surprising that interest should have been renewed in the affection, more particularly in regard to its epidemiology, its early diagnosis, the most efficient form of treatment, and to the measures to be adopted for the prevention of its spread.

It is not my intention to impose on your good nature with a lengthy and complete presentment of the disease. Such you may find in any good text-book of medicine and in numerous monographs which have appeared at various times. Rather do I wish to draw your attention to certain phases of the subject that have impressed themselves on my mind after a fairly extensive experience with the disease. My remarks are intended, indeed, to bring to the fore certain facts, more especially in regard to the diagnosis, the clinical course, the treatment and the prophylaxis, which have, in my opinion, been insufficiently appreciated in the past. As you know, last winter we were faced in Halifax with a small epidemic of epidemic meningitis, embracing some forty cases, to some extent affecting the naval and military classes, but much more the civilian population. This year we have met with occasional sporadic cases among the troops, with, on the contrary, a very few

Read at the meeting of the Halifax Medical Society, March 15th, 1916.

among the citizens at large. This latter outbreak has so far not reached the dignity of an epidemic, owing, I believe, to the energetic measures adopted to combat its extension. I have, therefore, had the good fortune to study the disease at close range, and from different points of view, so that I have been enabled to get some first hand information, and form some opinions which, I trust, may be of value.

In order to clarify the subject I may, perhaps, be permitted to remind you of certain well established facts. Epidemic cerebro-spinal meningitis is an infectious disease, having a sudden onset, with chilly sensations, fever, vomiting, and more or less intense headache. There may be pains in the back and limbs; sooner or later stiffness of the neck with retraction of the head, mental hebetude, restlessness, delirium, and coma. Kernig's sign is an almost constant feature. Skin rashes of various kinds are not infrequently present. The complications are bronchitis, arthritis, pareses and paralyses, pulmonary œdema, pneumonia, pleurisy, endocarditis, nephritis, cystitis, panophthalmitis, and, rarely, pericarditis. The sequelæ may be mental changes, paralyses of various muscles, notably the ocular ones, and deafness.

The disease may not appear in a community for years. Then, sporadic cases may be met with: occasionally, epidemics. It is most apt to make its appearance among soldiers and sailors, and in institutions where people are massed together. It is said, also, that it is more likely to occur when other infectious diseases are prevalent, such as measles, scarlatina, diphtheria, influenza, and poliomyelitis. Possibly this is a mere coincidence, or, in the case of the two last mentioned conditions, a faulty observation, due to confusion in the diagnosis.

From the name cerebro-spinal meningitis, one might get the notion that we are dealing with an infection localized to the integument of the central nervous system. There are, however, sufficient reasons for thinking that this view is incorrect. The specific organism has, in the early days of the disease, been isolated from the blood and urine, though as time goes on it tends to disappear from the circulation and become restricted to the meninges of brain and cord. The appearance of a petechial eruption at the onset of the trouble, as also the occurrence of multiple arthritis, in the exudation of which the causative organism has been demonstrated, affords strong support to the opinion that in the early stages the disease is really a bacteriæmia. The analogy between epidemic cerebro-spinal meningitis and such infections as typhoid fever, pneumonia, and smallpox is, therefore, close. In the first two

of these, at least, we find at first a generalized bacteriæmia, after a time the infective agent becoming localized to some particular structure. This has some bearing upon the matter of treatment.

It is, I believe, generally accepted now that the infection starts from the nasopharynx, the specific organism being found in this situation in the great majority of those suffering from the disease, in a variable proportion of those who have been in contact with the disease, while remaining free of it themselves, and in two per cent. of healthy individuals. Combining the figures of Bruns and Hohn, Black, Whiteside, v. Lingelsheim, and Sutherland, I find that among 2,109 contacts there were 27·2 per cent. of "carriers". Mayer and Waldmann found 158 "carriers" in a garrison of 9,111 men in Munich, who were healthy and had not been exposed to infection, at a time when the disease was not epidemic.

A word or two may be said with regard to possible channels of infection. Owing to the close anatomical relationship of the upper portion of the nasal cavity with the brain case, one would naturally expect that the infective agent would reach the meninges through the cribriform plate of the ethmoid, but the weight of evidence is against this view. One does not often find purulent matter in the ethmoidal cells, nor are the lesions necessarily most marked in the associated regions of the brain. On the other hand, the disease has all the hall-marks of a generalized blood infection. The sudden onset with generalized pains, the early appearance of a rash, the occasional early involvement of the joints, the occurrence of purulent pericarditis, and, above all, the discovery of the causative organism in the blood and urine, can hardly have any other explanation. It is, probable therefore, that the infective agent passes from the nasal cavity quickly into the blood stream through the intermediation of the regional lymphatic channels.

Some interesting points come up in regard to the clinical course and diagnosis of epidemic cerebro-spinal meningitis which are illustrated very well in the series of cases I now bring to your attention—cases which for the most part occurred in the city of Halifax and its vicinity, but also to some extent throughout the province. I will give you in brief the main features of these, as they will afford convenient texts on which to pin some of my subsequent remarks.

There are sixty-two cases of which I have notes. In forty-six the diagnosis was made certain by lumbar puncture and subsequent examination of the cerebro-spinal fluid. The other cases could certainly be regarded as epidemic meningitis, in view of the clinical features, and the history of association with other cases which were diagnosed by laboratory methods.

The *onset* was sudden in thirty-eight; in seven at least of the remainder it was somewhat gradual, extending over three to four days, with chills, or chilly sensations, fever, vomiting, headache, and pains in the back and limbs. In one, the disease began as a bronchitis, which improved after three days, the patient being discharged from hospital, returning in six days more with the typical features of the disease.

Retraction of the head, or stiffness of the muscles of the neck, was noted in fifty-four instances: absent in one; not recorded in seven.

Kernig's sign was present in fifty-four; absent in two; not recorded in six.

With regard to rashes, *herpes* was observed in thirteen; *petechial spots* in six; *erythema* in two; *macules* in one; a *scarlatiniform* eruption in one; a *morbillar* eruption in one.

The *complications* were, pneumonia (lobar) in two; œdema of the lungs in two; bronchopneumonia in one; otitis media in two; erysipelas in one; tonsillitis in one; nephritis in one; cystitis in one; purulent pericarditis in one.

The *sequelæ* were, squint, usually temporary, in seven; deafness, more or less permanent in five; blindness in one; ptosis of one eyelid in one; paresis of certain flexor tendons of the right arm in one; paresis of the right quadriceps extensor in one.

Death occurred in nineteen, or about 30·6 per cent.

From what has been said it will be gathered that the symptomatology of this disease is of a very protean character. It may be useful here to review some of the features.

The temperature is irregular, remittent, or intermittent, and conforms to no known type. It may suggest sepsis, or may simulate malaria. Rarely, it is of slight grade, and may even be absent.

Retraction of the head is usual and may develop into complete opisthotonos. Yet, it may be slight or absent, and the patient may complain merely of soreness of the neck muscles. The sign is more pronounced in the epidemic form of meningitis than in the tuberculous.

Kernig's sign is almost invariably present and is strong evidence, if well developed, of an involvement of the spinal meninges. It is absent in cerebral meningitis, and in those extremely fulminating cases of the epidemic disease which terminate fatally in a few hours.

Brudzinski's sign may be present when Kernig's is questionable.

Rashes, in my experience, are not commonly present, with the

exception of herpes. They may prove misleading. The petechial eruption has led at times to the erroneous diagnosis of typhus fever or malignant small-pox. In one case of my series the occurrence of a diffuse erythema associated with acute pharyngitis and tonsillitis led at first to the diagnosis of scarlatina. The progress of the case, however, made the nature of it clear in three or four days.

The pulse is very variable. Often it is in the neighbourhood of one hundred. Sometimes it is slow, from fifty to sixty per minute. The mental state of the patient is early and markedly affected. Dullness of intellect is common, but the patient may rouse enough to answer questions slowly. Coma, however, may come on quickly. In several of my series, the patient went to bed well and was found unconscious in the morning. Low muttering, or even violent, delirium is sometimes met with. It may be remarked, also, that while a patient cannot be roused he may exhibit great reflex excitability, tossing about in bed and resisting any interference or attempts at restraint.

Cases may be conveniently classified according to their clinical course into *regular, fulminating, abortive, larval* or *masked, ambulant* and *chronic.*

The regular cases are those which present a somewhat sudden onset, with vomiting, chills, fever, pains in the head and body, followed by retraction of the head and the appearance of Kernig's sign. Occasionally, there may be sore throat, conjunctivitis, and a rash. These usually recover in two or three weeks. The most of my cases, naturally, fall into this category, and they call for no extended description.

In the fulminating type the onset is abrupt, with fever, vomiting and headache. Unconsciousness supervenes within a few hours. Ten of my series belong to this group. Of these, one died in twenty hours; two in thirty-six; two in forty-eight; one in four days; and four recovered. It is worthy of note that in the most acute case, which occurred in an infant of three months, Kernig's sign was absent, and the retraction of the head was not marked. The diagnosis would have remained in doubt had it not been for the fact that another child in the family shortly after developed the disease which was definitely determined by an examination of the cerebrospinal fluid. One of the cases that recovered became unconscious within twelve hours and remained so for forty-eight hours. These fulminating cases may run a surprisingly short course. Several are reported which ended fatally in twelve hours or less. Gordon met with one in which death occurred five hours from the onset of the

trouble. In this connexion I would like to emphasize the point that death may result before any of the cardinal features of meningitis have had time to develop.

The ambulant form is characterized by the presence of a catarrhal inflammation of the conjunctivæ, nose, throat, and bronchi, which may go no further, or may manifest mild septicæmic features. One case of this kind that I saw recently developed the classical signs of meningitis only on the ninth day. Unless observed in connexion with epidemics of the disease the true nature of these ambulant forms is apt to be overlooked.

Two of my series fall into the abortive class. Coming on with very acute symptoms, one of them, indeed, with rapidly supervening coma, the condition nevertheless quickly subsided, and the patients felt well in two or three days. Some of these cases may last a week.

The larval, or masked cases, are those which develop imperfectly or anomalously, so that they simulate other unrelated diseases. Thus, the patient takes ill suddenly, as in eight cases of my series, with chill, fever, vomiting, pains in the back and limbs, suggesting influenza. Again, pain in the right iliac fossa, an irregular temperature of remittent type, and a slow pulse, will simulate typhoid fever, as in two others. However, the Widal test was negative, and the subsequent development of pain on movement of the head, with marked delirium, the Kernig sign, and an outcrop of herpes, suggested cerebro-spinal meningitis, which idea was confirmed by lumbar puncture. In others, though I have no personal knowledge of the type, an irregular temperature, intermitting daily, or every third day, has suggested malaria. Still other cases set in with joint pains and even definite arthritis, simulating inflammatory rheumatism.

Only one of my cases could be called chronic. It lasted three months and the patient died comatose, with extreme emaciation and large bedsores. At autopsy, a very small amount of rather viscid pus was found in the interpeduncular space, with marked internal hydrocephalus. Many of these cases progress by a series of relapses, and the symptomatology is often puzzling. They may last six months. Mental dullness and aphasia have been noted as sequelæ, and other symptoms referable to intracranial pressure.

The diagnosis of epidemic cerebro-spinal meningitis, when running a regular course, is not difficult. The sudden onset, severe headache, retraction of the head, vomiting, the Kernig sign, especially if a petechial eruption occur, present a characteristic picture.

The trouble will usually arise in connexion with the fulmin-

ating cases which die before the characteristic features have had time to appear. These may lead to the suspicion of uræmia, diabetes, poisoning, or apoplexy. An examination of the urine will help here. The history, as well as a search for the characteristic signs of irritant or narcotic poisoning, will usually reveal the truth in regard to that possibility. Apoplexy is, of course, more common in elderly people; cerebro-spinal fever in the young. The presence of arteriosclerosis, local palsies, or hemiplegia favour the former condition. The palsies of meningitis arise somewhat late, during the course of the disease rather than at the onset. The sudden development of a febrile illness, with vomiting, chills, pain in the head together with the rapid onset of delirium or coma, should always arouse the suspicion of meningitis, especially in the case of young persons and those previously in good health. The probability becomes greater if at the same time an epidemic of this disease be in progress, or if cases of meningitis have previously occurred in the same house.

Again, the ambulant and larval cases may be mistaken for "feverish colds", bronchitis, influenza, typhoid fever, rheumatic fever and malaria. The ambulant cases can hardly be diagnosed in the absence of careful bacteriological studies of the secretions. A history of contact will elucidate these forms. The difficulty in regard to influenza is often great, for the early symptoms in both diseases are very similar.[1] Moreover, there is such a thing as an influenzal meningitis. Herpes is common to both diseases, but there is no rash in influenza. The blood picture in influenza shows no leucocytosis, while in epidemic cerebro-spinal meningitis the leucocytes are considerably increased, from 14,000 to 38,000 per c.mm. Retraction of the head, with stiffness of the muscles and Kernig's sign, would be in favour of meningitis.

In polyarthritic cases, simulating inflammatory rheumatism, a diagnosis may, possibly, be made by the detection of the meningococcus in the blood, urine, or the fluid in the synovial sacs.

Differentiation from typhoid fever is perhaps the most difficult of all, for cerebro-spinal fever may run a typhoidal course, and, conversely, typhoid fever may set in with meningeal irritation. Osler refers to cases of typhoid that he has met with, beginning with high fever, delirium, photophobia, retraction of the head, and muscular irritation, in which autopsy has revealed the lesions of typhoid fever with an absence of those of meningitis. In such doubtful cases, one may have to wait for the manifestation of disease to unfold themselves further. Cultures from the blood, urine

or stools, may suffice to give the correct clue to the nature of the trouble. In older cases the Widal test will be of some service, except in those who have received anti-typhoid inoculation. In one case of my series, pain in the right iliac fossa, an irregular temperature of remittent type, and a slow pulse suggested typhoid fever. The agglutination test was negative on two occasions, and the development of Kernig's sign, some pain on movement of the head, with marked delirium, and the eruption of a herpes, suggested epidemic meningitis, which was confirmed by lumbar puncture. A petechial rash is rare in typhoid fever.

In one case of my series, an infant, abdominal pain and rigidity suggested appendicitis or other acute condition of that character.

Typhus fever may also raise a doubt, but is so rare nowadays in this country as hardly to call for consideration.

When there is a doubt as between meningitis and malaria, a blood examination will clear up the diagnosis. In malaria there is no leucocytosis while in meningitis there is. Also the presence or absence of the malarial parasite will settle the question.

One other disease requires special mention—acute anterior poliomyelitis, which may begin acutely with high fever, chills, vomiting, and pains in the body. The resemblance to epidemic meningitis is sometimes close, particularly when we remember that there may be paralyses in this affection also. Poliomyelitis, however, is more common in the summer months, meningitis in the fall, winter and spring. The early onset of paralyses, which attain their maximum very quickly, the sudden fall of the temperature, the flaccidity and eventual atrophy of the involved muscles, the distribution of the lesions, and the reaction of degeneration, will indicate infantile paralysis. Nowadays, too, with improved technique, as Flexner has shown, it is possible to demonstrate the presence of the causative organism in the latter affection.

I have referred above to "meningismus" in typhoid fever. One case which I saw recently with Captain Carney at the Military Hospital presented some soreness of the muscles of the back of the neck, headache and Kernig's sign. Thinking that we had to do with meningitis a lumbar puncture was done. The fluid came out under distinct pressure but proved to be normal otherwise. The following day the patient developed a lobar pneumonia and the signs of meningeal irritation disappeared

Having determined the presence of meningeal inflammation, it still remains to decide upon the variety at work. Apart from the epidemic form we may recognize, tuberculous, syphilitic, pneumo-

coccal, septic, and influenzal meningitides. If one can exclude disease of the middle ear, mastoid cells, or frontal sinuses, or, again, pneumonia, the diagnosis lies almost certainly between tuberculous and epidemic meningitis. Only very exceptionally do we find a purulent cerebro-spinal meningitis (not meningococcal) in the absence of a local lesion. I have seen one such, a streptococcus case. Syphilis may be detected or excluded in many cases by the Wassermann test. The final court of appeal is the examination of the spinal fluid. In competent hands the removal of a small amount of cerebrospinal fluid (not more than 5 c.cm.) for diagnostic purposes is a procedure devoid of risk.

If the fluid be clear, with not more than a suspicion of opalescence in the deposit on centrifuging, one should think of meningismus, tuberculosis of the meninges, syphilis of the central nervous system, very early epidemic cerebro-spinal meningitis, chronic epidemic cerebro-spinal meningitis, or, non-involvement of the meninges. In meningismus and all forms of meningitis the fluid is released under decided pressure. An examination of the centrifuged deposit will show in the inflammatory cases a more or less pronounced increase in the number of the contained cells. In general, a relative predominance of the mononuclear (lymphocytic) elements suggests either tuberculosis or syphilis. In such cases the discovery of the tubercle bacillus, which is somewhat difficult, or the existence of a Wassermann reaction, will clinch the diagnosis. I wish to emphasize, however, as it is not widely known, that occasionally one may find a perfectly normal cerebro-spinal fluid at the outset of an epidemic cerebro-spinal meningitis, as, also, a clear inflammatory fluid showing a relative increase in lymphocytes. One case in my series at first gave a perfectly normal fluid, though on a second tapping the next day the fluid was becoming purulent. In three cases the fluid was clear, with lymphocytic increase, presence of increased globulin, and deficient reduction of copper solutions. No meningococci could be detected. Two of these cases, on a second tapping, the following day, gave a purulent fluid, with polynuclear excess, and the presence of meningococci. The third was a chronic epidemic meningitis, which ended fatally after three months. The autopsy showed hydrocephalus and a minimal amount of pus at the base of the brain. After prolonged search two meningococci were detected in films from the exudate. In this connexion I may cite an interesting case that I saw in consultation with Dr. H. V. Kent, of Truro. A little girl of eight years took ill rather gradually with fever, headache, vomiting.

When I saw her at the end of a week she had all the usual features of cerebro-spinal meningitis. The fact that the family for four months had been using the milk of a cow that proved to be tuberculous strongly suggested the tuberculous nature of the case. I did a lumbar puncture and got a clear, watery fluid under pressure, which showed, along with the other features of an inflammatory exudate, a relative and absolute lymphocytosis. I could not find tubercle bacilli or meningococci. I was surprised to find that the child began immediately to improve, did not need a further tapping, and when I saw her again, six weeks later, was perfectly well. In this case we had either a tuberculosis of the meninges which got well, a possibility, but extremely unlikely, or an epidemic cerebro-spinal meningitis of unusual character. In view of subsequent experience, I believe it to have been the latter. Being aware of these exceptions to the general rule, I now advise in cases where the examination of the fluid is inconclusive on a first test that a second puncture be made. The fluid then obtained is usually characteristic enough to support a positive diagnosis.

A purulent cerebro-spinal fluid points to pneumococcal, streptococcal, influenzal, or meningococcal infection. Rarely, the fluid is purulent in tuberculous cases. I have seen one such instance. Here the bacilli were as numerous as in any sputum. In all these forms polynuclear leucocytes are in excess and appropriate methods will usually reveal the causative organism. The meningococcus, however, I may remark, is often very scanty, requiring a prolonged search before it is revealed. The failure to find organisms in such a fluid, or to obtain cultures of any organism, is in favour of the diagnosis of epidemic cerebro-spinal meningitis.

The power of the cerebro-spinal fluid to reduce copper solutions is lost, or at least impaired, in all forms of inflammation. This will differentiate, among other features, an inflammatory exudate from the fluid of meningismus. I do not believe, however, that this test is of any value in differentiating between different forms of meningeal inflammation. In the early stages of epidemic cerebro-spinal meningitis the copper reducing power may be diminished: it is lost during the fastigium of the disease, and reappears as the case improves. The test is, therefore, in my opinion, only of value as indicating an early or mild involvement of the meninges, or as indicative of commencing improvement, when the copper solution is reduced.

I have found Boveri's globulin reaction of considerable assistance in diagnosing the existence of an inflammatory exudate. In

this test a few c.cm. of a 0·01 per cent. solution of potassium permanganate are floated by means of a pipette upon the surface of the suspected cerebro-spinal fluid placed in a test tube. If globulin in excess be present a bright yellow ring forms at the line of junction of the two fluids. This will form immediately in a strongly pronounced reaction, but may be delayed for several minutes. Six minutes is the outside limit fixed by the originator. When the two fluids are mixed together by shaking the purple of the permanganate is converted into a brown. One possible fallacy has to be remembered in doing this test. Should the cerebro-spinal fluid contain blood the test will be positive.

A few words on treatment. I pin my faith to Flexner's serum. Recent workers in England, notably Rolleston, have recorded the comparative failure of this method of treatment. This may, possibly, be explained on the assumption that many of the cases were due to strains of the specific organism differing from those used in preparing the curative serum. It is hardly likely, however, that a larger proportion of such resistant cases would fall to the lot of certain medical men to the exclusion of others. Recent work has shown that in only 20 per cent. of cases are the recovered organisms what may be termed "para" organisms, immune to the influence of the Flexner serum. Granting this to be true, it cannot explain a mortality of 50 to 60 per cent. in serum treated cases. I rather conclude that the serum used has been comparatively inert, probably due to the fact that, owing to the enormous demand for serum, the serum giving animals have been bled too freely, and a poor quality of the remedy therefore put out. On the other hand, we have the experience of A. Gardner Robb, of Belfast, whose results have been more like our own, a death rate of about 30 per cent. in serum treated cases. It would be hard to find a practitioner of any experience on this side of the water who does not consider the use of the Flexner serum the only reliable form of treatment. I have had no personal experience with the new serum prepared by Professor Flexner, which is much more polyvalent than the old, but I am prepared to believe that it will be even more efficacious.

In the matter of dosage, I am inclined to think we do not always use the remedy vigorously enough. In the fulminating cases 30 c.cm. should be injected twice in twenty-four hours, until at least a minimum of 120 c.cm. has been given. It will be well in some cases to give more. Then, if the case is coming under control, 30 c.cm. should be given daily, or, possibly, every second day,

until meningococci disappear from the cerebro-spinal fluid. In cases seen within the first twenty-four hours, if of a fulminating character, and particularly if there be a rash, I have given, in addition to the intrathecal injections, intramuscular injections of 15 c.cm. with, I think, benefit This on the theory that we are dealing with, at this stage, a bacteriæmia. At all events, the cases, all of them unpromising, in which I tried this plan, recovered rapidly. I am inclined to think that the best hope of cure is to use the serum freely at the start. If then, the case still does badly, it is likely that further injections will prove useless. I have seen not a few cases now in which, after a temporary improvement following the first few injections, the disease apparently became resistant to further doses of the serum, and the patients have died. There is a possibility here that unless the serum is used in massive doses at the start the organisms develop protective substances of their own which enable them to resist its action. In cases that fail to improve under the Flexner serum, I think that frequent tapping of the vertebral canal, to relieve pressure, and remove at least some of the germs, is the only line of treatment that gives any promise. Urotropin may be administered, as it is excreted to a small extent into the subdural space, or intramuscular injections of soamin, but I am not satisfied that these measures materially alter the result.

I personally believe that it is better to give a general anæsthetic before doing the spinal puncture, unless the patient is actually comatose. He thereby avoids the depressing effects of the pain, and there is no possibility of a mishap occurring from an unlucky movement, while the operator has more scope. I have not found any particular benefit to accrue from taking the blood pressure during the operation. If the patient becomes very pale, or, again, cyanosed, with irregular respirations, the proceedings should be stopped. It is well to keep the injecting needle in place for some minutes, until one is assured that these untoward symptoms are not likely to persist. If they do, it is easy to allow some of the injected fluid to drip away. In any case, it is wise to instruct the nurse in the evidences of trouble, so that she may keep an eye on the patient for an hour after the tapping. The physician should be within easy call, and in case of evidences of danger, such as those mentioned, should at once repeat the puncture and relieve the pressure.

Some physicians work on the principle that one should inject a quantity of the serum not more than the amount of cerebro-spinal fluid previously removed. It will sometimes happen that only

from 10 to 15 c.cm. of the fluid can be removed when the flow stops, or there may even be a dry tap. In such cases I have not hesitated to inject the full dose (30 c.cm.) of the serum. The only untoward results that I have seen from this have been a sharp rise of temperature and an increase in the amount of headache. These unpleasant features, however, do not last, and the resulting benefit more than compensates for the temporary disturbance. It is wise not to remove all the fluid that it is possible to withdraw after this has totalled 40 c.cm. Sudden death has resulted from this procedure. And it is well to replace the removed fluid as quickly as possible with at least an equivalent amount of serum. It should be pointed out that it is wise to give two or three injections even after the case appears to be out of danger. Cases may, it is true, recover, after but one dose, but, on the other hand, they may relapse or become chronic. The outlook then becomes problematical.

The patient, if very restless, should be controlled by sedatives. The most efficacious is morphine. Continual tossing about does much to weaken the sufferer. Attention should be given to the bladder and bowels. Some will require regular catheterization. It is most important that the patient should be given sufficient nourishment to tide him over the critical period. If unconscious, the stomach tube should be used.

I have had no opportunity of using meningococcus vaccines in the chronic cases, but I believe they should be tried.

Finally, I wish to state my opinion emphatically that the physician is not justified in relaxing his efforts because he regards the outlook as hopeless. The only type of case I have found to die invariably is the one which early develops œdema of the lungs. Nothing is to be expected from treatment here. But, even the fulminating cases, the most unpromising, not infrequently get well in a most remarkable fashion, and sometimes more quickly than the apparently milder forms. Therefore, "Do not give up the ship." Give the serum in full doses and often, and persevere, hoping even against hope. You may save a life.

Finally, what should we do in the matter of prophylaxis? In regard to the patient, we should take much the same precautions that we would take in the case of typhoid fever. If there be conjunctivitis, the eyes should be treated by instilling a few drops of Flexner's serum several times daily. This may be supplemented, if necessary, by drops of argyrol 5 per cent. The urine should be disinfected before throwing it away. When the patient has re-

covered sufficiently, the throat and nose should be sprayed with some mild antiseptic wash, such as 1 per cent. peroxide of hydrogen, several times daily for three weeks. Doctors, nurses and attendants, while looking after cases of epidemic meningitis, should use sprays for the nose and throat immediately after their visits, should wear protective aprons, and should wash the hands and face before leaving for other duties. These precautions should be taken because we have reason to think that more than twenty-five per cent. of contacts harbour the germ in the respiratory passages, though most authorities agree that the contacts themselves, curiously enough, rarely contract the disease. Where cases occur in private houses, in addition to the measures just detailed, it is well to isolate the sufferer rigidly. All contacts should be kept under observation and their noses and throats sprayed twice daily for two weeks.

Where cases break out among troops, the following measures, in brief, should be adopted. Patients suffering from the disease should be removed at once to special isolation quarters; the rooms from which such are removed should be disinfected with their contents. All close contacts should be removed to other quarters where they can be segregated and kept under observation. The term "close contacts" may be taken to mean the man sleeping on each side of the patient: the man messing on each side of him, and his chum. Such contacts under surveillance should be paraded three times daily, examined for any signs of disease, and their throats and noses should be sprayed with 1 per cent. peroxide of hydrogen. They should be instructed to report at once if they develop headache. They need not be kept in close confinement, but should not consort with other men, and should have their own dishes and towels kept apart from all others. Short route marches and light drills are an advantage. After two weeks, if no new cases develop among them they may be liberated.

For the remainder of the battalion: they should be instructed to report at once all cases even of minor illness to the medical officer. They should be paraded twice daily and sprays used for their noses and throats for a period of two weeks. Any men presenting suspicious symptoms should immediately be quarantined until the diagnosis is made. It is of great importance that the barracks should at all times be well aired, and the men should be encouraged to keep out of doors as much as possible, unless the weather be inclement. It is well, also, to stop all leave and keep the men from going to public gatherings of all kinds while under

observation. Young recruits should be treated leniently in the matter of drills and fatigues until they have become hardened. Care should be taken to keep the barracks scrupulously clean, particularly endeavouring to lessen the amount of dust in sleeping quarters and on parades. The floors should be disinfected twice weekly with Izal or similar substances so long as a battalion is under suspicion. If the surface to be covered be large, a spraying apparatus, such as is used for oiling roads, may be used with economy of energy and time.

Experiments are now under way, both in England and Germany, to find an efficacious and harmless method of disinfecting the respiratory passages of meningitis contacts on a wholesale scale. The idea is to put the men into a room, one or two hundred at a time, in which the atmosphere is saturated with moisture and impregnated with a disinfectant gas. (Such as chloramine.) Two or three applications of the method for twenty minutes is supposed to kill any meningococci that may be present. It is somewhat too early to pronounce upon the virtues of the several plans of this nature that have been proposed, but we seem to be within measurable distance of success in this particular. It is to be hoped that something may come of it, for with a procedure of this kind, if efficient, it would be easy to disinfect a whole battalion in times of epidemic, without recourse to the somewhat cumbersome and aggravating measures that I have outlined just above.

THE CLINICAL PATHOLOGY OF THE CEREBRO-SPINAL FLUID

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I WISH to direct your attention this evening to a constituent of the body which is of the greatest possible clinical and practical importance, but which has been largely neglected by the general practitioner in the past, and which even yet receives but scant attention from the text-books on diagnostic methods. That, however, as much information of the highest value is to be derived from an examination of the cerebro-spinal fluid as from that of the blood or the urine, it is my object to demonstrate to you to-night.

Let us first devote a few minutes to some points of importance in connexion with the anatomical arrangements of the ventricular system and spinal sac, and some with regard to the physiology of the fluid. We shall then be in a position better to face the clinical problems which present themselves.

Anatomy

The cerebro-spinal fluid is secreted within the ventricles by the ependyma covering the choroid plexuses. There is possibly also an extraventricular source, namely, the perineuronic and perivascular spaces, which communicate directly with the subarachnoid space. It fills the ventricular system of the brain, and, passing through the openings in the roof of the fourth ventricle—the foramen of Magendie in the middle line and the foramina of Luschka on either side—it enters the subarachnoid space, which extends over the whole brain and down the spinal canal.

It is generally considered that a very free communication exists between the ventricular and the subarachnoid spaces, an idea to which support is given by certain experimental facts. For instance, when such a dye as methylene blue is injected into the spinal sac, its presence can be demonstrated later in the ventricular fluid. It is by no means certain, however, that such a free inter-

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communication does exist in health. For the spinal fluid may show very distinct differences in composition from the ventricular fluid. In jaundice the spinal fluid is tinged yellow, whilst the ventricular fluid remains colourless, and in general paralysis the globulin content of the two fluids may differ to a marked extent. It is difficult to reconcile these facts with a free passage between the two systems. Further experimental work is needed before this point can be finally settled.

Lumbar Puncture

The spinal cord ends at the level of the lower border of the first lumbar vertebra. The arachnoid sac, however, is continued down as far as the second sacral vetrebra, and as this part of the sac contains nothing but the roots of the cauda equina and the cerebro-spinal fluid, a needle may safely be inserted anywhere below the second lumbar vertebra. The widest space is that between the fourth and fifth lumbar vertebræ. A line drawn between the highest points of the iliac crests passes just above this space.

It is unnecessary for me to describe in detail the operation of lumbar puncture. The procedure is a perfectly safe one, except in one condition, namely cerebral tumour, and especially a tumour situated in the posterior cranial fossa. In this condition, indicated by the clinical symptoms and the very high pressure under which the fluid spurts from the needle, not more than 2 or 3 c.c. of fluid should be withdrawn, for a number of fatalities have been recorded. Some authorities even recommend that saline solution, equal in amount to the fluid withdrawn, should be run into the spinal canal.

Physiology

Only a few facts of any importance are known concerning the physiology of the cerebro-spinal fluid. It is a clear, colourless, limpid fluid, with a faintly alkaline reaction, and a specific gravity of 1006 to 1008. It contains a trace of globulin, and a substance, probably glucose, which reduces Fehling's solution. It contains an occasional lymphocyte, but no polymorphs.

The cerebro-spinal fluid is a true secretion, and not a mere transudation, that is to say, the epithelium of the choroid plexus exercises a selective action. So selective is this action that very few substances are permitted to pass from the blood into the fluid, a fact of the highest importance from the therapeutic standpoint. Under conditions of health only three substances are allowed pass-

age in any quantity—alcohol, chloroform and urotropine, the last-named appearing in the fluid in the form of formalin.

As is only to be expected, however, in disease conditions the barrier breaks down; albumen makes its appearance in acute and chronic inflammations, urea in uræmia, glucose, acetone, and diacetic acid in diabetic coma, lactic acid in eclampsia, bile pigment in jaundice, and appreciable quantities of alcohol in acute alcoholism. In tubercular meningitis the meninges are peculiarly permeable to nitrates, and when sodium nitrate is given by the mouth, it may readily be detected in the spinal fluid. This is a point of differential value between tubercular and septic meningitis, and it is needless to emphasize the importance, from the standpoint of prognosis, of any means which will enable us to distinguish between these two great groups of meningitis.

Naked-Eye Changes

The naked-eye appearance of the fluid may yield information of the greatest value. The fluid may be blood-stained, turbid, or clear.

First, the fluid may be *blood-stained:* The presence of blood may be due to accidental tearing of part of the subarachnoid venous plexus during the puncture, or the blood may have been preëxistent in the fluid. The conditions may be differentiated in two ways. Collect the fluid in two tubes. If the blood be due to the operation, the fluid in the second tube will probably be clear. If, however, a large vein has been punctured, the fluid in both tubes may be tinged. In that case the fluid should be centrifuged. If the blood be accidental the red corpuscles will be brought to the bottom of the tube, whilst the supernatent fluid will become clear. If it be due to a former hæmorrhage, the supernatent fluid will remain tinted, owing to the blood corpuscles having become hæmolysed.

The demonstration of the presence of preëxisting hæmorrhage in a case with a history of injury to the head is of great practical value, for it points almost infallibly to fracture of the skull with tearing of a meningeal vessel. Cases have been described in which a diagnosis of meningeal hæmorrhage was made from examination of the spinal fluid, the artery was exposed, the bleeding point found and tied, and the patient's life saved. In a case which I saw recently the diagnosis of fracture of the skull was not made till an examination of the cerebro-spinal fluid had shewn the presence of blood.

Secondly, the fluid may be *turbid.* Turbidity indicates the

presence of polymorphs, which are never present in the normal fluid, and their presence is as a rule an indication of acute inflammation of the meninges. It is important to note that in cerebral abscess there is no change in the fluid, unless the meninges are involved, or unless the abscess has burst into the lateral ventricles. Thus, if a patient shows signs of acute cerebral trouble, accompanied by a high leucocytosis in the blood, but a normal cerebro-spinal fluid, the probability is that he is suffering from abscess of the brain. This is one of the cases where a negative finding is of positive diagnostic value.

Thirdly, the fluid may be *clear*. To conclude from this, however, that it contains no abnormal cells or microörganisms is an error of the first magnitude. The fluid is not rendered turbid by the presence either of lymphocytes or bacteria. Enormous members of lymphocytes may be present in tubercular meningitis, but the fluid may appear quite normal. Again, if the fluid be examined in cases of typhoid shewing marked cerebral symptoms, large members of typhoid bacilli may be found, without any increase of cells or other indications suggestive of meningeal inflammation.

Cytology

There are three ways in which the cells of the cerebro-spinal fluid may be examined. The number of cells per c.mm. may be estimated by using the counting chamber introduced by Fuchs and Rosenthal, which is a modification of the Thoma-Zeiss blood-counting apparatus.

Or, the French method may be used, whereby the fluid is centrifuged, the deposit examined, and the number of cells in each field of the microscope counted.

Finally, if it is desired to make an accurate study of the cells present, Alzheimer's method should be employed. Absolute alcohol is added, the fluid centrifuged, and the precipitated globulin draws down with it all the cells into a firm coagulum, which is embedded in celloidin, and sections are cut. In this way the cells are perfectly fixed, and can be differentiated with an exactness which is quite impossible with the ordinary French method.

In health there should not be more than four or five lymphocytes per c.cm. or in each field of the microscope, using a high power magnification. No polymorphs are present.

In certain morbid affections of the central nervous system and its meninges there is a great increase in the cell count. In acute meningitis, the *polymorphs* are present in enormous numbers, pro-

ducing, as a rule, turbidity of the fluid. As the meningitis becomes less acute, however, and still more when recovery is taking place, the polymorphs may gradually be replaced by lymphocytes. I recently made a series of daily observations on the spinal fluid of a case of epidemic cerebro-spinal meningitis. At first the cells were entirely polymorphs. As the condition of the patient began to improve, lymphocytes made their appearance, till there were fifty per cent. of each type of cell. When I last saw the patient, apparently completely recovered, there were still large numbers of cells in the fluid, but these were almost entirely lymphocytes.

In herpes zoster, with its pathology of hæmorrhage into the posterior root ganglia, a leucocytosis is also found in the spinal fluid.

The *lymphocytes* are increased in certain subacute and chronic infections of the central nervous system. The chief of these are tuberculosis and syphilis, including so-called parasyphilis, that term which is rapidly becoming defunct, and which should receive a decent burial, so as to make way for the much more rational and scientific expression, "parenchymatous syphilis."

It is often stated that these are the only conditions in which a cerebro-spinal lymphocytosis is met with. This is not the case. I have encountered a number of cases of obscure mental disease in which a lymphocytosis occurred, but was certainly unexpected, for there was no evidence or suggestion of syphilitic disease of the nervous system. These cases all bore a marked family resemblance to one another and approximated more closely to *dementia præcox* than to any other known mental disorder. In some cases of mumps with marked symptoms of cerebral irritation, a cerebro-spinal lymphocytosis may be encountered. In one such case which I examined—a soldier in Belgium—there were over thirty cells per c.mm.

In the early stages of acute anterior poliomyelitis, lymphocytes are present in large numbers. They are most numerous in the pre-paralytic stage, and rapidly disappear, so that by the end of the fourth week, the cell count may be normal.

With these somewhat rare exceptions, however, we may lay down the rule that a cerebro-spinal lymphocytosis in a case with symptoms suggestive of acute or subacute meningeal inflammation is a strong indication of tubercular meningitis, whilst the same symptom in a chronic condition is the strongest possible evidence of cerebro-spinal or parenchymatous syphilis. It is now admitted by all neurologists that the earliest, the most easily recognized, and the most certain of all the physical signs of general paralysis and

tabes dorsalis is lymphocytosis in the cerebro-spinal fluid. And further, the earlier the case, the more marked is the increase, so that in the cases which are most difficult to diagnose the sign is the least equivocal. Everyone knows how puzzling and how worrying a doubtful early case of general paralysis may be. The question of prognosis is so grave, and the physical and mental signs often so indeterminate, that any assistance in clearing up the diagnosis is welcome. The presence of a cerebro-spinal lymphocytosis, especially if coupled with a positive Wassermann reaction, is worth all the other physical and mental signs put together.

Tertiary syphilis of the central nervous system is usually accompanied by a lymphocytosis in the spinal fluid. This as a rule is not so marked as in parenchymatous syphilis, but in some cases of severe and acute syphilitic meningitis an extremely high count may be met with. A valuable means of differentiation is afforded by the therapeutic test. The lymphocytosis of tertiary syphilis rapidly gives way to anti-syphilitic treatment, whilst that of parenchymatous syphilis is extremely resistent. Further, the Wassermann reaction, although present in the blood is very often absent in the cerebro-spinal fluid unless large quantities of fluid are used, whereas in general paralysis it is present in about ninety-five per cent. of cases. In a few cases of undoubted cerebro-spinal syphilis there is no increase in the cells of the spinal fluid. These cases are examples of that variety of the disease which is confined to the arteries; the meninges will be found to be unaffected.

It is now recognized that the nervous system is frequently involved at a very early stage of syphilitic infection. Such an involvement may give rise to only very slight clinical signs, which may be readily overlooked or misinterpreted, but an examination of the cerebro-spinal fluid will at once reveal the true nature of the case. It is hardly necessary to emphasize the extreme importance of recognizing an involvement of the nervous system at this early stage, for it is at this stage that we have it in our power to check the development of those terrible sequelæ, which makes syphilis one of the most malignant of diseases. Neisser, at the recent International Medical Congress in London, stated that no one should be passed as cured of syphilis until the cerebro-spinal fluid had been reduced to a fully normal condition.

That a marked increase in the number of eosinophil cells in the blood is a very constant accompaniment of infection by animal parasites is a well known and established fact. It is interesting to learn that an eosinophilia may occur in the cerebro-spinal fluid for

a similar reason. Two cases of cysticercus cellulosæ of the brain have recently been described* in both of which there was a marked eosinophilia both in the blood and in the cerebro-spinal fluid. Such a condition may safely be considered as pathognomonic of animal parasitic infection of the central nervous system. Whilst touching on the relation of animal parasites to the cerebro-spinal fluid, it may be mentioned that several cases have been reported recently in which *Trichina spiralis* was found in the cerebro-spinal fluid. Lintz† is of opinion that as the larvæ appear to reach the spinal fluid at an early stage of the disease, we may have in lumbar puncture a method of considerable diagnostic importance.

From what has already been said it is clear that an examination of the cells of the cerebro-spinal fluid may yield information of the greatest value in diagnosis. Let me briefly describe a case which illustrates this in a remarkable way:

The patient, an ex-soldier, when first seen complained of headache and dimness of vision. Two years previously he suffered from severe headaches and a left hemiplegia, which cleared up completely under anti-syphilitic treatment. Five days prior to admission he again began to suffer from severe headache, his sight rapidly failed, and he lost the power of his left arm. I examined the cerebro-spinal fluid and found it to contain 110 lymphocytes per c.mm. The evident diagnosis to all appearances was a return of the syphilitic cerebral affection, and energetic anti-syphilitic treatment was adopted, but without avail. He rapidly became worse, his sight failed utterly, and he passed into a condition of coma, which terminated in death five days after admission. Shortly before death a quantity of cerebro-spinal fluid was withdrawn in the hope of relieving the increased intracranial pressure. To my surprise I found that the fluid was now turbid, and contained large numbers of polymorphonuclear leucocytes. An acute infection had therefore been superadded to the chronic one. The next step was to visit the post-mortem room, and there we found the key to the mystery. In the right motor area were the remains of a syphilitic gumma; here was the cause of the hemiplegia two years ago, and of the lymphocytosis which still persisted. In addition to this, however, two acute abscesses were present, one in the right motor area, the other in the occipital lobe. The pus from the latter

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* Waterhouse, R., "Cysticercus Cellulosæ in the Central Nervous System," *Quart. Jour. Med.*, 1913, vi, 469.

† Lintz, W., "Trichinosis and the Cerebro-spinal Fluid," *Journal A.M.A.*, 1916, lxvi, 1856.

had made its way into the ventricles, and thence to the base of the brain through the locus perforatus posticus. The abscesses were the cause of the recent hemiplegia, the loss of vision and the polymorphs in the cerebro-spinal fluid. The interest of the case lies in the fact that the change in the cerebral condition was faithfully mirrored by the change in the cerebro-spinal fluid, although in the present case the information was acquired too late to be of service to the patient.

Many different kinds of irritant may cause an increase of the cells in the cerebro-spinal fluid, the nature of the cells varying with that of the irritant. It is important to realize that the irritant need not be bacterial in nature. The injection of strong sterile salt solution into the spinal canal of a dog will produce a leucocytosis. In a recent number of the *Journal of the Royal Army Medical Corps** some observations are recorded which appear to me to have very great practical importance. The writer had been treating tetanus in soldiers by the intraspinal injection of antitetanic serum. He examined the spinal fluid before the injection and twenty-four hours after the injection. As a result of the injection large numbers of polymorphs appeared in the fluid, although the fluid itself remained sterile. In every case who died a definite meningitis was found. There is at the present time a tendency to inject all sorts of substances into the spinal canal, in view of which tendency it may be advisable to keep in mind these observations on the effect of antitetanic serum.

Protein Content

In the normal fluid there is no albumen and only a trace of globulin. The protein content is thus extremely low. In acute inflammatory conditions, in general paralysis and tabes dorsalis, and to a lesser extent in cerebral syphilis, it is greatly increased. In these conditions albumen makes its appearance, and globulin is present in excess.

A multitude of tests have been devised for showing this increase, but of these I shall only mention three. The *Noguchi* test consists in the addition of butyric acid and sodium hydrate to the spinal fluid; a flocculent precipitate indicates a positive result. In the *Pandy* test a little cerebro-spinal fluid is run down the side of a dish containing 10 per cent. carbolic acid. If globulin is increased, a precipitate is formed. In the *Ross-Jones* test the cerebro-spinal

* Ingleton, A. T., "Aseptic Meningitis following Intrathecal Injection of Antitetanic Serum," *Journ. R.A.M.C.*, 1916, xxvi, 234.

fluid is run on to the surface of a solution of ammonium sulphate. If there is a globulin increase, a sharp clear-cut line appears at the junction of the two fluids.

The two latter are such essentially simple tests that to me it is remarkable that they have not come into more common use. For a moment's reflection will show that often it is infinitely more important to know if a patient has albumen in his cerebro-spinal fluid than to know it if is present in his urine. No one wants to apply such a test in a case of acute meningitis, but in syphilis of the nervous system it is even more valuable than the Wassermann test applied to the cerebro-spinal fluid, for the Wassermann may be negative, although the albumen is largely increased.

Perhaps the condition in which the practitioner would find the test most useful is tubercular meningitis. You see a case which you suspect to be one of meningitis. You withdraw the cerebro-spinal fluid and find it to be clear. The case, therefore, is evidently not one of cerebro-spinal meningitis. But still it may be one of tubercular meningitis. You may be far from centrifuges and other laboratory facilities, but you can always test for albumen by means of a little 10 per cent. carbolic acid. It may make all the difference in settling the diagnosis.

An albumen reaction and an increased cell count usually go together. There is, however, one exception to this rule. In tumours of the spinal cord, without any increase in the number of cells, there may be enormous quantities of protein in the fluid; indeed in this condition it is not uncommon to get spontaneous coagulation of the fluid on standing.

The Wassermann reaction, which has proved so invaluable in the examination of the blood, has also proven of the greatest value when applied to the cerebro-spinal fluid, where it is suspected that the syphilitic infection has spread to the central nervous system. In ordinary cases of syphilis the Wassermann reaction is positive in the blood but negative in the cerebro-spinal fluid. In general paralysis a strongly marked Wassermann reaction is nearly always present in the spinal fluid as well as in the blood. In tabes it is present in only about 50 per cent. of the cases. In cerebro-spinal (interstitial) syphilis it is usually absent when the original Wassermann technique is used. When, however, larger quantities of fluid are employed, a positive reaction may be obtained.

When a positive Wassermann is obtained in cerebro-spinal syphilis, it may be difficult to distinguish the condition from parenchymatous syphilis, that is to say, general paralysis and tabes.

We have other means at our disposal, however. When energetic anti-syphilitic treatment is employed, the positive Wassermann reaction in cerebro-spinal syphilis rapidly becomes negative, whereas in parenchymatous syphilis it is extremely resistant. The lymphocytosis and the globulin excess follow a similar course.

There is a further point. In human blood there occurs an antibody which will hæmolyse the red blood corpuscles of the sheep. In acute meningitis both this antibody and complement pass from the blood into the cerebro-spinal fluid. In general paralysis this antibody appears in the fluid, but not the complement. In cerebro-spinal syphilis neither are present.

Finally the recently introduced gold chloride reaction of Lange is positive in over 90 per cent. of cases of general paralysis, but the characteristic curve is obtained in less than 5 per cent. of cases of cerebro-spinal syphilis.

Bacteriology

The bacteriology of the cerebro-spinal fluid need not detain us long. A large variety of organisms have been described as occurring in acute meningitis, but the only common ones are the meningococcus, the pneumococcus, and the streptococcus. Of these three the meningococcus is much the least virulent. Tubercle bacilli can as a rule be demonstrated in tubercular meningitis if suitable methods be employed. As already mentioned, typhoid and other bacilli may occur in the spinal fluid without apparently causing meningitis, just as they may occur in the urine without causing cystitis. In a case of acute mania which I saw some time ago I succeeded in isolating a diplococcus from both the blood and the cerebro-spinal fluid. In this case there was no evidence of meningitis either during life or at the post mortem. Such a case as this suggests distinct possibilities in the treatment of certain types of acute insanity.

Therapeutics

The question of therapeutics is too wide a one to be entered into in detail in this paper. A mere reference to some of the more important points must suffice. The operation of lumbar puncture may be performed as a therapeutic measure. Of all the methods of treating meningitis I should place it easily first in value. After all, it is only putting into practice one of the first principles of surgery. By withdrawing the purulent fluid, which is usually under pressure, not only is the excessive intracranial pressure re-

duced, which in itself must allow a much freer cerebral circulation to take place, but an opportunity is given for fresh fluid rich in antibodies to be poured into the ventricles. If this procedure be repeated every day it will be found to be of the highest value. From 20 to 30 c.c. may be withdrawn on each occasion.

Flexner's antimeningococcal serum when injected into the spinal canal has proved a potent therapeutic measure in the American epidemics. In Belgium, however, where cerebro-spinal meningitis was very prevalent, we found it to be absolutely useless. Parallel series of observations were made, and actually better results were obtained by simple daily withdrawal of the fluid, than from the use of serum. The reason for this, of course, was that the serum was not truly specific. It is well known that the meningococcus is an organism which possesses a number of different strains, differing from one another in agglutination and other characteristics. The serum prepared from the American strains is evidently unsuitable for the cases occurring in Belgium.

One of the few substances which can readily pass from the blood into the cerebro-spinal fluid is urotropine, which appears in the fluid in the form of formalin. On this account it has been extensively used in the treatment of meningitis. The formalin formed is, however, present in so great a dilution, that it is very doubtful if it can be of the slightest use as a therapeutic agent. But in acute middle ear disease, head operations, and other conditions in which there is a risk of meningeal infection, the administration of utropine by the mouth is probably a prophylactic measure of high value.

So many papers have appeared recently on the treatment of syphilis of the nervous system by the intraspinal injection of salvarsanized serum, that the subject need only be alluded to. The method advocated by Swift and Ellis is roughly as follows: An intravenous injection of salvarsan is given. An hour later 20 c.c. of blood are withdrawn, and the serum, diluted with saline, is injected into the spinal canal, a corresponding amount of cerebro-spinal fluid having been first withdrawn. In tertiary syphilis of the central nervous system extremely good results are obtained, in tabes there is often a marked amelioration of the active meningitic symptoms, especially the lightning pains, and even in general paralysis temporary improvement, or at least an arrest of the progress of the disease may occur. It cannot for a moment be pretended, however, that a specific cure for paresis has yet been discovered.

Lumbar puncture may take the place of a decompressive operation for lowering the intracranial pressure in cases of cerebral tumour with optic neuritis, but the dangers of the procedure must be kept in mind, and only small quantities of fluid should be withdrawn at a time. Uræmic coma and convulsions,* and cases of puerperal eclampsia, conditions probably always associated with cerebral œdema, are sometimes relieved by lumbar puncture in a way which can only be described as extraordinary. About 20 c.c. of fluid may be withdrawn from a patient in a state of profound coma, and in half an hour he may be fully conscious.

To sum up, then, lumbar puncture with an examination of the cerebro-spinal fluid may be of value in the following circumstances:

1. The diagnosis of meningitis from such conditions as meningism and cerebral abscess.
2. The recognition, by a bacteriological examination, of the organism causing the meningitis, with the possible result that successful therapeutic measures may be adopted.
3. The detection of meningeal hæmorrhage resulting from fracture of the skull.
4. The diagnosis of early cases of general paralysis, tabes dorsalis, and secondary and tertiary syphilitic infection of the central nervous system.
5. The relief of the headache, vomiting, and optic neuritis in cases of intracranial tumour.
6. The relief of symptoms, and in some cases the permanent cure, of cases of acute meningitis.
7. The lowering of intracranial pressure in uræmic coma and convulsions, and in puerperal eclampsia, when all other methods of treatment have proved of no avail.

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* Russell, A. E., "Lumbar Puncture as a Means of Relief in Uræmic Coma." *Proc. Roy. Soc. Med.*, 1907, vol. 1, pt. 2, p. 103.

SOME CASES OF SYPHILIS OF THE EYE FOLLOWING TREATMENT BY SALVARSAN

By Lieutenant-Colonel S. H. McKee and Captain H. D. Courtenay, C.A.M.C.

AS a factor in etiology syphilis looms large in diseases of the eye. There is practically no part of the organ of sight from the palpebral conjunctiva to the optic nerve that is not attacked by this virus. The conjunctiva has been the seat of primary and secondary lesions and from the latter the spirochæta pallida has been demonstrated. The cornea is frequently attacked in subjects with congenital syphilis, and it is well understood nowadays that this part of the eye is frequently diseased in "acquired" syphilis. The commonest cause of iritis is syphilis, while the dust-like opacities of the vitreous in retino-choroiditis are supposed to be pathogenic of syphilitic infection.

At the West Cliff Canadian Eye and Ear Hospital, we have been meeting with quite a considerable number of cases where the lesion was due to syphilis:

Case 1. Private C. C., aged eighteen. Right eye inflamed for one week. Denies exposure but has been taking pills for a rash that has disappeared. Iritis;—Wassermann, triple plus.

This case demonstrates a point frequently brought out some years ago; namely, patients taking mercurial pills often develop an ocular lesion which is only cleared up by the inunction or injections of mercury.

Case 2. Private G. A. Entered West Cliff Hospital on December 29th, 1915, complaining of dimness of vision in the right eye for some months. Right and left interstitial keratitis—Wassermann, quadruple plus.

Case 3. Private J. T. Entered hospital January 26th, 1916, complaining of dimness of vision of some weeks' duration. Neuro-retinitis. Wassermann, plus.

These three cases are quoted to demonstrate that in syphilis any of the important parts of the eye may be attacked.

We have been specially interested in following up the cases of

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syphilis of the eye, which have occurred after treatment by arsenic preparations. In an article in the *British Medical Journal* for April 29th, 1916, page 614, Lucey says "that this course of treatment does give him a reasonable chance is shown by Gibbard and Harrison's statistics produced at the International Congress of Medicine, 1913. On a precisely similar course, but using the German preparation "606", they found that only 3·9 per centum of cases relapsed clinically and 19·4 per centum serologically within a year of the suspension of treatment, and again I believe kharsivan to be every bit as potent as the original German preparation."

In connexion with these statements we wish to cite the following three cases:

Case 1. Private W. E. Entered West Cliff Hospital, January 6th, 1916. Marked dimness of vision for which he had been sent back from France. Examination showed double-sided retino-choroiditis syphilitica.

This patient had been in the Tent Hospital, St. Martins Plain, in July, 1915, and while there had received three doses of salvarsan.

Case 2. Private P., aged twenty-four years. Entered West Cliff Hospital April 19th, 1916, complaining that both eyes had been inflamed and painful for two weeks. There was marked photophobia, internal ciliary injection, and after installation of 2 per cent. atropine, posterior synechiæ, nearly of entire irides, in other words, marked iritis. The history was that patient had a chancre in January, 1916, and entered Aldershot Hospital where he had five injections of "606" and five of mercury during a period of six weeks. When he entered here, April 10th, 1916—Wassermann, triple plus. April 30th, under mercurial inunctions irides have quieted, left pupil almost normally dilated. Vision in each eye, 6/9. C.

Case 3. K. B., eighteen years. Entered West Cliff February 24th, 1916, with optic neuritis. He gave a history of lues and had been treated in September, 1915, with three injections of "606" and five of mercury during a period of two months. Right and left vision, 6/18. Marked optic neuritis in each eye. Wassermann, triple plus.

Under mercurial injections, the condition has improved and on March 23rd, vision, 6/9 in both eyes.

We have brought forward these three cases of a series which have interested us in view of the fact that within six months of their treatment they have entered a hospital with syphilitic lesions of different parts of the eye. The diagnosis of syphilis was made by the clinical appearance and the Wassermann reaction.

THE MODE OF ORIGIN OF HOMOLOGOUS TWIN PREGNANCY AND ITS BEARING ON THE CELL THEORY

By John Cameron, M.D., D.Sc., F.R.S.E.

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IT is now many years ago since Schleiden* and Schwann† made a microscopic examination of the ultimate structure of animal and plant tissues, and, as a result, presented to the scientific world the "cell theory", which still holds its own to this day in spite of repeated attempts to overthrow it, particularly within the last twenty-five years or so. These two observers, with the comparatively primitive microscopic appliances at their disposal, were enabled to demonstrate that the elements of tissue structure could be recognized in the form of masses of protoplasm containing nuclei, and, in the case of plant tissues at any rate, enclosed within a definite cell wall. They therefore pictured a plant or animal as built up of myriads of these cells all cemented together just like the bricks and mortar of a building. This theory was accepted by scientists without demur for many years, until it was attacked in 1873 by Heintzmann‡ in a vigorous communication, in which he demonstrated that the cells of a tissue were not discrete bodies, but were united together to form a continuous nucleated protoplasmic network which he regarded as of the nature of a *syncytium*.

With the great advances which have been made in the last twenty-five years, not only in perfecting microscopic appliances, but also in the fixation and preparation of histological material, many fresh details of tissue structure have come within our powers of vision, which of course must have been totally unknown to Schleiden or Schwann. The result is that many histologists

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* *Müller's Archiv.*, 1838.

† *Mikros. Untersuch.*, Berlin, 1839.

‡ *Sitz. d. k. Akad. Wiss.*, Vienna, 1873.

within the last two or three decades have begun to reconsider their attitude towards the accuracy of the cell theory, however convenient the latter may appear to be from the point of view of teaching. Recently Dr. R. J. Gladstone and the writer* published a paper dealing with the structure of the blastoderm in which we showed the blastoderm to be distinctly of the nature of a syncytium or plasmodium. The latter term was adopted by us, as being a more accurate description of the structural appearances observed. We hope in time to be able to demonstrate that this "plasmodium theory" can be applied to all the tissues of the body—both adult and embryonic.

When a theory is founded upon a previous hypothesis which is afterwards proved to have been fundamentally inaccurate and unsound, the mischief becomes very seriously aggravated. I cannot cite a better example of such a danger than by referring to the germinal localization theory of self-differentiation which was promulgated by Roux.† This investigator declared that definite portions of the ovum were reserved in the earliest stages for the production of the various organs or tissues of the body, this view being that, by the time the morula stage was reached, certain groups of cells had been definitely set aside for this purpose. Roux therefore surmised that at the first segmentation of the fertilized ovum, one primary blastomere would produce the right half of the body, and the other the left half. He further argued that he ought to be able to produce a hemi-embryo from each primary blastomere, but he did not succeed in doing this experimentally. Roux's speculations were entirely founded on the fundamentally inaccurate cell theory, but he was so obsessed by his idea that at first he thought, from experiments he carried out with the blastomeres of frogs' ova, that he had succeeded in producing such a hemi-embryo, passing through the stages of hemi-morula, hemi-blastula and hemi-gastrula. A few years after the publication of Roux's paper, Morgan,‡ Wilson‖ and Jenkinson§ conducted an elaborate series of experiments; the two former observers on the ova of *Amphioxus*, the latter on those of the frog. These investigators obtained results utterly opposed to those of Roux, for they found that if the

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* *Journal of Anatomy*, Vol. 50, 1916.

† *Virchow's Archiv.*, 1889.

‡ *Arch. Ent. Mech.*, 19, 1905.

‖ The Cell, 1906.

§ Experimental Embryology, 1909.

two primary blastomeres were absolutely separated from one another, each developed into a *complete* embryo, though only half the normal size. Some of their later experiments likewise gave interesting and convincing results. For example, from a blastomere of the four cell stage, they were able to obtain a normal blastula, gastrula and sometimes even the stage of an embryo, which was, however, only one quarter of the normal size. Similarly they found that a blastomere of the eight cell stage produced a morula though this did not gastrulate, whilst a blastomere of the sixteen cell stage gave rise merely to an indefinite group of cell elements. Driesch,* Jenkinson† and others conducted further investigations on the ova of *Echinus*, which are particularly suitable for experimental work of this kind, and these yielded practically identical results.

If one were to apply the results of these experiments to the case of man, one would arrive at the conclusion that if the two primary blastomeres *did* normally separate from one another, each ought *always* to give rise to a complete embryo in the natural process of development. The result would be the production of what are called homologous twins. The latter, as is well known, are always of the same sex, are small at birth, and exhibit a remarkable similarity of mentality and facial feature. Ahlfeld‡ found that of five hundred and six cases of twins, only sixty-six proceeded from a single ovum, so that homologous twin pregnancy is obviously a comparatively rare condition.

Whether the two primary blastomeres become totally separated, or still remain in some degree of protoplasmic continuity at the completion of the first segmentation of the fertilized human ovum, has of course not been observed, and never will be. However, it is well known that in slightly later stages—in the Teacher-Bryce specimen, for example, which is one of the earliest known human ova—the cell elements lining the two central cavities of the blastocyst form a continuous syncytium or plasmodium. Has this protoplasmic continuity been primary or secondary? It seems to me that the comparative rarity of homologous twin pregnancy supplies us with the only available answer to this important and very difficult question. Since Wilson, Morgan, Jenkinson, Driesch and others have conclusively proved experimentally that total

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* *Arch. Ent. Mech.*, 10, 1900; and 16, 1903.

† *Op. cit.*

‡ Quoted by Piersol, in the "American Textbook of Obstetrics."

separation of the two primary blastomeres gives rise to two embryos, the only possible inference is, that the continuity of the protoplasm of the two primary blastomeres in the human subject would only become completely severed in the production of a homologous twin pregnancy. One can therefore argue that, normally, a total severance of continuity does not take place, which permits some mutual coördinating influence or interaction between the two primary blastomeres, the result being the production of a single embryo. It is thus remarkable to note how a simple clinical condition like homologous twin pregnancy can substantially assist in the elucidation of a very complex histological and embryological problem which would otherwise remain insoluble.

Dr. Gladstone and the writer* were able to ascertain the nature of this protoplasmic continuity in the segmenting ova of lower animal forms. We found that this was due to the differentiation of the protoplasm of the ovum during segmentation into two distinct portions, namely, a portion exhibiting all the typical characteristics of cytoplasm in which the nuclei were imbedded, and to which we gave the name of endoplasm, and a clear comparatively achromatic portion, named by us the ectoplasm, which surrounded the periphery of the morula mass and also extended inwards between the individual cell elements (Fig. 1 B). The failure to recognize the existence of this ectoplasm is due to the remarkable resistance which it exhibits to the action of staining reagents in its *nascent* condition. It appears to be extruded from the interstices of the protoplasm of the segmenting ovum during the profound disturbance produced in the cell body by karyokinesis, and it is the material which constitutes the bond of union between the blastomeres, thus preserving their structural continuity. A fuller recognition of this important differentiation of protoplasm into an active endoplasm, and a more passive ectoplasm will, it is believed, provide histologists with a more consistent view of the structure and development of the tissues of the body than that provided by the cell theory of Schleiden and Schwann.

* *Op. cit.*

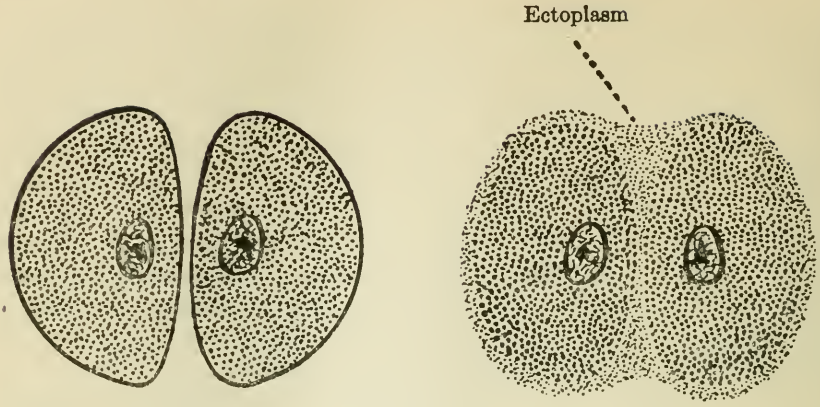

FIG. 1

FIGURE 1 is a study in contrasts. *A* shows the conventional representation of the first segmentation of the fertilized human ovum, which is a complete severance, according to the cell theory, and gives rise to the two primary blastomeres. Roux's opinion, which was founded on the cell theory, was that one primary blastomere gave origin to the right half of the body, and the other to the left half. The later experiments of Wilson and others, however, controverted this by showing definitely that each primary blastomere, if totally isolated from its fellow, gives rise to a *complete* embryo. The conclusion to be drawn from these results is that the two primary blastomeres in the human subject become totally separated from one another only in the production of a homologous twin pregnancy. Therefore *B* shows what probably occurs at the close of the first segmentation of the fertilized human ovum, the two primary blastomeres being represented as still held together in structural continuity by a connecting zone of ectoplasm.

A FULLY equipped base hospital unit, consisting of thirty surgeons, two dental surgeons and seventy-five nurses, recently left England for France, under the command of Lieutenant-Colonel Jones of Boston. The unit was offered to the British Government by the Medical Senate of Harvard University in November, 1915, and the Universities of Yale, Columbia, Princeton, and Johns Hopkins have been associated with Harvard University in providing it. The work will be conducted under the direction of the Royal Army Medical Corps and will continue until the end of the war.

CONSIDERATIONS IN THE DIAGNOSIS AND SURGICAL TREATMENT OF GASTRIC AND DUODENAL ULCER

By J. K. McGregor, M.D.

Surgeon to Hamilton City Hospital

IN the presentation of this paper, I wish to say that the deductions which I may draw are made from cases on which I have done an operation for ulcer of the stomach or duodenum, after an exploratory operation. I mean by this, that many cases are put through an exploratory stomach operation without an ulcer being found.

There are in this series, forty-five consecutive cases operated on without mortality, 75 per cent. being males and 25 per cent. females. The average age was thirty-five years; the average duration of distress ten years. The percentage of gastric to duodenal ulcers found was as one to four, or 20 per cent. gastric and 80 per cent. duodenal.

I may say that thirteen cases of my series have been operated on within the last three months and while I can say that improvement was noted in every case of the series, and 60 per cent. I consider cured, the latter statement is a relative one only, in so far as the latest thirteen cases are concerned.

In making the diagnosis it is our custom to place absolute reliance not on academic signs as read of in text-books, but on two main sources of information, viz: (*a*) the personal history as given by the patient himself; (*b*) the result of radiography, the latter being the more important and reliable, but only, I would add, when the diagnostician or surgeon is an *x*-ray operator himself, or else in close relationship with one.

Let us refresh our memories by reviewing briefly the symptoms of duodenal ulcer as given by Moynihan. Pain—coming on towards the time of the next meal—relieved by alkalies, food, etc, the attacks gradually becoming more prolonged and the time between the periodic exacerbations becoming shorter. You are all

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familiar with the saying, "show me a patient who takes a biscuit to bed to relieve his pain and I will show you a duodenal ulcer," but we have found that this so-called hunger pain is not always present, and we have all seen cases of hyperacidity relieved by alkalies which is due to causes entirely outside the stomach and duodenum. Other signs are given, such as gas belching, acid in the mouth, furred tongue, chalky teeth, constipation. Tenderness is a sign of doubtful importance and Eusterman says, when it is present from a considerable to a marked degree, it suggests a probable perforation. Hæmorrhage is rarely seen in duodenal cases.

In gastric ulcer, food is not liable to give relief. Thus, pain beginning soon after ingestion of food, vomiting and hæmatemesis are the three symptoms usually found in the history of these cases.

In the radiographic diagnosis of duodenal ulcer, the combination of six-hour residue after a barium or bismuth meal and hyperperistalsis are the most important signs. Signs of lesser importance are the persistent deformity of the cap or bulb, hypermotility, pressure-tender point over the duodenum and lagging of bismuth in the bulb, which is best seen fluoroscopically by turning the patient with his left side slightly towards the operator.

Those who are familiar with the work of such men as Cole, Carman, George and Case, know how varied are the claims for their methods of examination.

In gastric ulcer, the *x*-ray is the only reliable means of diagnosis, and its findings, if positive, are as sure as anything can be. Haudek's niche I have observed in three cases of the series. This niche, which occurs on the lesser curvature shadow, when combined with an incisura on the greater curvature, is a positive sign of perforated ulcer of the stomach. Bismuth often remains in the cavity thus formed, after the stomach is empty. The incursa can best be seen when the stomach is filling. Cole of New York does not place much reliance on Haudek's niche, while Carman of Rochester regards it as the only conclusive sign of ulcer. All other methods of examination have been purposely left out of this discussion.

An ulcer having been diagnosed, we would advise surgical intervention in all cases from the standpoint of relief from symptoms and also from the well-known fact that cancer often superimposes itself on an ulcer base. We would make the one exception to this, i.e., in those acute hæmorrhagic cases which are so common and which frequently make at least a temporary recovery under medicinal treatment.

The operative technique is usually a combination of posterior

gastro-enterostomy special treatment of the ulcer. In the duodenum, this means invagination or excision; in the stomach, resection or Balfour's method of perforation by cautery. The method used will necessarily vary according to the case. In duodenal cases some temporary means of blockage of the duodenum together with gastro-enterostomy should be the operation of choice.

In the gastro-enterostomy, we use an opening in the stomach from the right downwards and to the left, probably with more inclination to the vertical. The opening in the jejunum is made as close up as possible, with a short loop and slightly to the inner and upper side of the axis of the bowel, as it runs off to the left. We have not discarded the linen sutures for catgut, as has been generally done. No change has been made in the stomach opening, having always made it at the most dependent portion of the greater curvature.

Balfour's operation for ulcer of the lesser curvature—resection of the middle portion of the stomach with a gastro-gastrostomy without resection and anterior gastro-enterostomy with entero-enterostomy were each done once in our series of cases.

W. J. Mayo favours gastro-enterostomy in every case in addition to excision of the ulcer. He also adds that "when a resection in continuity of the stomach with an end-to-end union has been made for chronic ulcer, results have been excellent without gastro-enterostomy." It was, however, in this class of case that we met our worst result, the patient's symptoms returning after three months and examination showing an hour-glass constriction.

Following along Roving's idea of diaphanoscopy, we have substituted the cystoscope for the gastroscope to detect ulcer. I have never seen this used in any clinic, which appears strange to me, as it suggests itself as a very useful procedure.

It has been found in animals that the duodenum can be examined directly by the cystoscope, but that the stomach contains enough mucous to obliterate the field. With an air bulb attached to the irrigating arm of a Braasch scope introduced through a small opening, we were able to get a wonderful diaphanous view of the walls and vessels of the stomach, the room having been darkened after the insertion of the scope. Recently, we have had a case which proved the value of this procedure. Mr. J., a patient of Dr. L. Jones, gave a history of ulcer which had been persistent. Upon examination through abdominal incision, nothing could be seen or felt. An opening was made into the stomach, the cystoscope

inserted, the stomach distended with air and the room darkened. Close to the opening made, a dark area one-fourth inch in diameter was plainly discernible and quite different from the surrounding parts. A small round ulcer of the mucosa presented, which when touched with the gloved finger, revealed an artery which actually spurted. The ulcer was invaginated and the wound in the stomach closed. The patient has had no further hæmorrhage.

If an ulcer cannot be found through an exploratory incision and suspicion points to the duodenum, I would suggest a small opening being made in the stomach near the pylorus about one and a half inches long; and with the point to the gloved finger, invaginate the wall of the duodenum through this opening, thus bringing its mucous surface into view. We have tried this on animals and find it difficult to accomplish and believe that it would be practicable only in cases where you were dealing with a very lax duodenum. Our experience has been limited to one case which was as follows:

Mrs. R., referred to us by Dr. Cody; aged forty-six, with signs of ulcer of the duodenum and hæmorrhage. Upon exploration, nothing was found. An opening was made and I was able to push the duodenum through the pylorus without any difficulty. A small punched out ulcer of the mucosa was present. This was in the first part of the duodenum and no white spot could be seen on the opposite serous surface. The examining wound was closed and a gastro-enterostomy done. The patient made an uneventful recovery.

In addition to showing a few slides of interesting cases, I would like to give the history of one other case. Mr. Fahey, aged thirty-three years, after being under observation in my service for a month, in which time an erroneous diagnosis was made, due to faulty Wassermann, later came to be considered a stomach case. This diagnosis was made upon the radiographic findings. The night before the day set for the operation, perforation occurred with the usual symptoms present. The following day a drain was introduced into the lesser sac, no closure being attempted on the perforation. The patient made such a good recovery that he refused any further surgical interference and returned to work. Several months later, he was compelled to return by paroxysms of pain in the epigastrium. Upon secondary operation the scar tissue was so extensive on the posterior aspect of the stomach that an anterior gastro-enterostomy was done together with an entero-enterostomy. The patient gained forty pounds in seven weeks

enlisted and has since gone to the front. We met with only one other perforation in our series. Gastro-enterostomy and closure of the perforation was followed by a recovery.

The post-operative treatment of these cases is to leave them alone. We have had no experience with the vicious circle and believe it must be due to some error in technique.

Patterson believes that the results gained are due to some physiological change, which decreases the acidity and allows of the healing of the lesion. Others have claimed that the results are due to some mechanical cause. Whatever the cause, we know that there is probably no class of chronic disease which offers more hope of cure or relief to the patient, with danger of operation reduced to a minimum.

THE following is the list of candidates who were successful in passing the examinations of the Medical Council of Canada held at McGill University, Montreal, in October: G. C. Anderson of New York; V. Blakslee of Kingston; J. A. Blezard of Warkworth, Ontario; G. F. Downing of Montreal; C. K. Church of Aylmer, Quebec; L. Garand of Montreal; N. M. Guion of Ottawa; G. Hodge of Cornwall; I. M. F. Malone of Three Rivers; J. A. MacMurchy of Kearney, Ontario; J. J. Macpherson of Port Daniel, Quebec; R. Michaud of Sturgeon Falls, Ontario; C. H. McCreary of Montreal; S. R. McGregor of New York; R. Oliver of New Westminster; I. Patterson of Chicago; W. R. Stackhouse of Blyth, Ontario; A. M. J. Tanney of Iroquois, Ontario; and W. E. Williams of Montreal.

Case Reports

FIVE CLINICAL CASES SHOWING CLINICAL ASPECTS OF PRIMARY AND SECONDARY SYPHILIS

By Captain A. W. Bagnall, C.A.M.C.

Shorncliffe Military Hospital

No. 1. Private T., aged twenty-eight years. Steel worker in civil life. Family history good. Married four years. One child of two years in good health. One child died at two months. Personal history—had a sore eight years ago which healed up promptly under local treatment. Had been on active service for eighteen months. Twelve months ago, after a blow, noticed swelling of fourth finger, left hand. In February, 1916, first reported to medical officer with swelling of fingers and had to leave trenches seven weeks ago on account of condition of hands and toe. Not much pain unless knocked. Has had two doses of kharsivan, 3 grams, five days apart; is getting also mercury and potassium iodide. Has enlarged inguinal glands, epitrochlears are also markedly enlarged. A few small warts about anus. Have not noticed yet any marked result of treatment. Wassermann reaction strongly positive. Condition more quickly shown than described. *X*-ray plates of this case were shown and explained by Captain Rolph.

No. 2. Corporal E., presented three recently healed chancres on skin of penis and pubes, each about one and a half by two inches oval. Onset three months ago, have been healed nearly one month. Several indurations can be felt through phimotic prepuce. Ulceration beside meatus—indurated. Inguinal epitrochlear and post cervical and axillary glands distinctly enlarged. Profuse dull red roseola which was fading prior to admission three days ago. Tonsils enlarged and ulcerated. Markedly seborrhœic condition of scalp. Spirochætes found in peri-meatal chancres. Had 0·3 grams kharsivan 24/6 mercury 1 gram to-day.

Read at the meeting of the Medical Society of the C.A.M.C., Shorncliffe, May 8th, 1916.

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No. 3. Gunner A. Had primary sore without secondary symptoms in January, 1916. Treated with five "606" and five mercury injections at Newcastle. Was readmitted June 15th with deep necrotic ulceration in former chancre which had healed but left marked induration.

Inguinal glands enlarged. Dark field smear: spirochæta pallidæ present.

No. 4. Private J. Presented six circular indurated chancres in roll of prepuce and adjoining sulcus. Onset about June 8th, 1916, had been exposed four weeks previously, inguinal and epitrochlear glands positive. Given 3 grams kharsivan on the 17th, 20th, 24th and 25th of June. Fine erythematous skin eruption; sores are healing.

Points of interest: Multiple chancres, period and type of eruption. Is it from kharsivan?

No. 5. Private H. Thirteen months at the front, on full duty until two months ago. Sent back on account of developing cardiac lesion after having dugout blown in on him. Had sore in February, 1916, healed in two weeks under local treatment. Came in on June 20th with pale roseola; mucous patches in mouth and condylomata lata about anus. Infiltration and reddened condition of scar of primary sore. Had 0·2 grams kharsivan only, on account of cardiac condition, on 21st and 24th of June.

The college of Physicians and Surgeons of Philadelphia announces that the next award of the Alvarenga Prize will be made on July 14th, 1917, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered. The prize was not awarded this year.

Editorial

AN UNDESERVED REPROACH

WE regret to note the premature appearance in the public press of a summary and extracts from a confidential report by Colonel H. A. Bruce, special Inspector General of Medical Services to the Canadian Expeditionary Force, which places the Canadian Army Medical Corps in an unenviable light. We wish to state that in the next number of the JOURNAL we will consider this report *in extenso* and make such criticisms as we consider just.

THE TREATMENT OF SOLDIERS SUFFERING FROM PULMONARY TUBERCULOSIS

THE treatment of soldiers suffering from lung disease presents some problems that have not been experienced to any great extent by sanatoria receiving civilian patients. Before the war began, patients for the most part paid in part or whole for their treatment, and realizing the seriousness of the financial sacrifices involved, and the long period of time covered by the treatment, if the result obtained was to prove permanent, devoted the time spent in the sanatoria to a careful observance of the directions given them by the medical directors.

In the treatment of *soldiers*, however, the case becomes more complex, as the patient is not defraying the cost, but is in fact receiving his regular pay and allowances while under treatment. Moreover, the soldier patient appears, as a rule, to be indifferent to his health, and in many cases looks upon the rest and regulation under medical routine as unnecessary and tiresome. For the most part the military patient has

been trained to but one occupation, and lacking imagination does not care to find a profitable means of filling in the time spent under treatment, and as a result becomes nervous and often despondent, which leads to indiscretions and frequently insubordination. The latter is especially the case when they have recovered sufficiently to begin exercises to restore the physical tone lost during the early toxic stage of the disease.

Broadly speaking, it would appear that tubercular patients in sanatoria are divided into three classes:

Class A: *Bed Cases.* Those patients who are suffering with the disease either in an acute or toxic stage and remain in bed until their temperatures are normal, and distressing symptoms are no longer present.

Class B: *Porch Cases.* Those patients who are allowed to attend the meal table three times daily, and rest in long chairs in the open during the remainder of the day.

Class C: *Exercise Cases.* Those patients who after passing through Class A and Class B, have had their disease sufficiently arrested to be benefitted by moderate and graduated walking exercise. Beginning with a fifteen minutes' walk morning and afternoon, the exercise is increased until four hours daily can be accomplished without signs of relapse.

It is of considerable interest to note therefore that several medical officers in charge of tuberculous troops have requested that suitably constructed workshops, and instructors, be supplied by the Military Hospitals Commission of Canada, for the education and interest of the soldiers under treatment.

With reference to the kind of work to be provided for these different classes, we have been informed that it is occasionally possible for patients in Class A to undertake some very light handwork, such as lace making, drawing and sketching, weaving, and embroidery, Patients in Class B could do more of the same kind of work as that done by Class A patients, and as their strength increased they could also undertake heavier work, such as reed-basketry, while both Class A and B patients could undertake academic work with advantage.

Patients in Class C will be prepared for active work by appropriate physical exercises; including walking, light fatigues and light squad drill. As soon as advisable, they will take up the various forms of Arts and Crafts work, such as basketry, carving, light cabinet-making, art metal work, picture-frame making, illuminating, engraving and stencilling, while those with a leaning towards horticulture, chicken raising and bee keeping in all probability will be afforded an opportunity of training along these lines. One medical officer has asked for an old automobile for the purposes of dissection and reconstruction, as he believes that with the present day automatic starting devices on motor cars, the occupation of a chauffeur is ideal for a man who has well-arrested pulmonary tuberculosis.

Each patient should, of course, be under daily medical observation, and his work should continue steadily if: (a) the patient's nutrition (weight) is maintained; (b) his temperature is normal; and (c) he is not suffering pain.

In addition to manual work, academic training is also included in the programme, with such occupations as telegraphy, stenography and typewriting, mechanical and industrial drawing, and if possible the installation of moving picture machines which can be used for instruction and recreation. The latter would also facilitate discipline, as the privileges of "the show" could be withheld from an insubordinate patient, who would miss it more than a mere monetary "fine."

The fact that properly regulated work will not harm, but rather benefit, the tubercular patient has been amply proved by the results of treatment in the best English sanatoria, and we heartily endorse the present movement by Canadian sanatoria directors, feeling confident that it will result in a physical and moral betterment of the tubercular soldier, that would be otherwise hard to attain.

DR. CAMERON ON HOMOLOGOUS TWINS

WITHOUT exceeding reasonable limits of space, it would be difficult to do justice to the questions raised by Dr. John Cameron in his interesting communication on the origin of homologous twins, and we will only venture to offer a few comments by the way.

The use of the terms syncytium and plasmodium is a point about which there is certain to be a difference of opinion. Apart from its etymology, syncytium, as currently employed, by no means necessarily implies secondary fusion of cells which were once distinct. Both primary and secondary syncytia are known. The former is one in which nuclear division takes place repeatedly, by mitosis, in advance of cell-division. On the other hand, the word plasmodium was originally applied to a stage in the life-history of some remarkable Fungi, the Myxomycetes, where it actually arises by the fusion of distinct amœboid organisms. There does not, therefore, appear to be sufficient reason for replacing a syncytial theory by a plasmodial theory. At present it is not easy to invent a proper definition of syncytium because of the prevailing custom of applying it indiscriminately in a general and in a special sense, in a morphological and in a physiological sense. In its most general connotation, syncytium would doubtless include plasmodium and perhaps the latter might be defined broadly as a syncytium endowed with specific motor activity. Thus, in the rabbit's placenta from the eleventh day, Duval (1889) described the penetration of the ectoplacental syncytium into the maternal capillaries, *gliding along their walls like a plasmodium.*

With regard to the strictures upon the work of W. Roux, it should, we think, be remembered that this investigator was the originator of methods of experimentation which have been adopted by a great following. The particular experiment referred to, when first performed about 1888, was a real achievement. He plunged a hot needle into one

of the first two blastomeres of the frog's egg so as to destroy its power of further growth, though leaving it attached to the uninjured blastomere. The latter developed into a half-embryo or semi-blastula. This was Roux's discovery. If his theory outstripped his facts, that is what commonly happens in such cases.

The origin of homologous twins is one of those remarkable episodes which happen, as it were, under our eyes, and yet are for ever barred from direct observation. The subject has been discussed over and over again, and in recent years more particularly by Dr. H. H. Wilder in the *American Journal of Anatomy* (vol. iii., 1904). Wilder favoured the hypothesis that duplicate (homologous or identical) twins are derived from a single ovum, by accidental separation of the blastomeres at the two-cell stage. This hypotheses receives some apparent support from the analogy of the effect produced by the artificial separation of the first two blastomeres of the sea-urchin's egg and others, as mentioned by Dr. Cameron. Also it depends in part upon the assumption that the first two blastomeres of the mammalian ovum are equipotential.

In 1875, the celebrated Belgian embryologist, E. van Beneden, maintained that the first two blastomeres of the rabbit's ovum differ in their properties, one of them giving rise to all the ectoderm, the other to endoderm and mesoderm. Now although van Beneden was wrong in his identification of mesoderm in the early blastocyst before the formation of the primitive streak, yet that would not in itself affect the question as to the homology of the first two blastomeres. Sobotta again (1901) raised a doubt upon this point.

A new complexion has been put upon the matter by the discovery of the development of the multiple embryos of armadillos from Brazil and Texas. The simpler case is that of the Texas armadillo which, according to the observations of H. H. Newman and J. T. Patterson (*Journ. Morph.*, 21, 1910) and Patterson (*Journ Morph.*. 24, 1913), regularly gives

birth to quadruplets, the members of which are either all males or all females. These develop in a single fœtal sac and from a single ovum. Up to a comparatively late stage of embryonic development, namely, the formation of the primary amniotic vesicle, the ovum develops in the characteristic mammalian fashion. Then a peculiar process of embryonic budding sets in, by which the originally simple embryonic primordium is quadrupled, and there are produced four blastodiscs, each with its primitive streak. In this case therefore, there can be no question of any separation of the early blastomeres, since the development is normal up to the stage of the primary blastocyst and amnion.

The various authors whose names have been mentioned above, have not referred to a paper by the late Richard Assheton on a blastodermic vesicle of a sheep of the seventh day, with twin germinal areas (*Journ. Anat. and Physiol.*, 32, 1898, pp. 362-372). It is a firmly established rule that a single blastocyst is the product of a single ovum. Therefore the presence of two blastodiscs at the surface of a single blastocyst indicates that a fission of the embryonic primordium has taken place at some early stage of development. Obviously the mind is carried back to the first cleavage of the ovum, when the blastomeres, as Dr. Cameron has explained, are probably held together by nothing more than a frail bond of ectoplasm. But if these two blastomeres by chance became separated, there ought to be, on Dr. Cameron's showing, two blastocysts, which was not the case.

The two blastodiscs, as described by Assheton, were of normal structure but about half the normal size. This fact again lends colour to the exactness of the analogy of the behaviour of isolated blastomeres of the sea-urchin. But what it also renders evident is the risk of trusting to the analogy between such widely different issues as the mammalian, echinoderm and amphioxine ontogeny. Assheton found that, at the morula stage, the future cavity of the blastodermic vesicle arises as irregular, vacuole-like spaces which subse-

quently coalesce. He suggested that during this vacuolization of the morula, the embryonic mass may have been split into two portions.

The theory of the origin of homologous twins in mammals by separation of the first two cleavage cells is enticing and up to a certain point logical. This only makes it all the more desirable that we should bear in mind the possibility, not to say probability, that it may not be true. Patterson (1913) points out that in all cases of normal polyembryony the cleavage of the egg is of the indeterminate type, so that it is impossible to trace out a cell-lineage for any particular embryo.

Enough has been said to show that Dr. Cameron's article is a welcome and refreshing contribution to the discussion of problems of biological interest and importance.

VOCATIONAL TRAINING

A REPORT on vocational training has been prepared by the Military Hospitals Commission and has been adopted by the Government. It is the intention to give such training to disabled members of the Canadian Expeditionary Force and also to disabled reservists of the British and allied armies who before the war were *bona fide* residents of Canada. The period of training will vary according to the previous education and industrial history of each individual. The Commission has received the assurance of the active coöperation of the provincial governments and the municipalities in providing such training, and a number of technical schools, agricultural colleges, public and private institutions have offered to give tuition, in the majority of cases free of cost, to disabled men and subsequently to provide them with employment. As has been stated already in the JOURNAL, training in general subjects and elementary vocational work has been commenced and in a few cases arrangements have been made for special training. It is necessary, however, to

make some provision for the personal expenses of the men during the period of training and the Commission has prepared the following schedule:

1. A single man, with pension, living in an institution, will receive board, lodging and washing.

2. A single man, with pension, living out, will receive sixty cents a day.

3. A married man, with pension, living in, will receive free maintenance and eight dollars a month, with the following additions:

For wife having no children, a monthly sum of thirty-five dollars, less her husband's pension.

For wife and one child, if child is under five years of age, $38; if child is from five to ten years of age, $39.50; if child is over ten years of age and under the maximum age, that is sixteen in the case of a boy and seventeen in the case of a girl, $42.50; less, in each case, the amount of husband's pension and children's allowances under the pension regulations.

For wife and two children, from $41 to $47 a month (less pension and allowances), according to the age of the children.

For wife and three children, $44 to $50 (less pension and allowances), according to the age of the children.

For wife and four children, $47 to $53; for wife and five children, $50 to $55; for wife and six children, $53 to $55; all less pension and allowances and according to the age of the children.

A wife with seven children will receive the maximum allowance of $55 a month, less pension and allowances. The money will be paid direct to the wife, unless otherwise thought fit by the Commission.

4. A married man living at home will receive sixty cents a day, in addition to the allowances for wife and children.

5. A widowed mother, if dependent entirely upon the unmarried son who is receiving training, and if the son made

an assignment of his pay to his mother and arranged for her to receive separation allowance while he was on service, may be paid at the same rate as the wife of a married man with no children.

6. The parents of a man undergoing training, if both are old and past work, and entirely or partially dependent upon him, may also be paid at that rate.

7. The guardian of a widower's children (under the maximum age) will be paid the following sums monthly: for one child, $10; for two, $17.50; for three, $22; and three dollars for each additional child, up to the maximum of thirty-five dollars.

These payments will be continued for one month after the completion of vocational training, whether employment has been secured or not.

A MEMORIAL to the late Dr. Robert Koch was recently unveiled at Berlin, Professor G. Gaffky, one of Koch's earliest pupils, presiding.

THE American Hospital of the Second Serbian Army, which has been established close to the Balkan front under the auspices of the commission for coördination of auxiliary service of the armies of the East, is devoted especially to the wounded of the Serbian armies. It is provided with all recent improvements and is almost entirely due to generous contributions made by Americans.

A NUMBER of cases of infantile paralysis have occurred in Montreal during the past few weeks. The disease exists in sporadic form throughout the Dominion and it has been found necessary to close the schools in a number of places. During the month of September seventy-six cases and seven deaths were reported in the province of Ontario, including one of a man fifty years of age, and from the first to the nineteenth of October nineteen cases and six deaths were reported.

THE medical faculty of Edinburgh University decided on August 28th, last, to admit women students. The decision no doubt has been arrived at in consequence of the tremendous demand made upon the medical profession by the war. The question came up for consideration eight years ago, when the Court voted emphatically against the admission of women students.

THE brutal treatment of Russian prisoners in the hands of the Germans is described by Senator Edouard Herriot, Mayor of Lyons, in a recent issue of *Le Journal*. Not only do these unfortunate prisoners suffer from cold and hunger, as it is extremely difficult to send food to them from Russia, but they are harnessed to heavily-laden carts which they are obliged to draw until they fall from utter exhaustion, when they are left to die. In the prison camps the slightest breach of regulations is punished with the utmost severity—the man's feet and hands are tied and they are then hung up by the wrists; when they lose consciousness, they are taken down and revived by cold water being thrown over them. The hanging is then repeated—perhaps eight times.

A CASE recently came before the Superior Court of the Province of Quebec in which a physician claimed the sum of $2,495 for professional services rendered. The plaintiff stated that at the request of the defendant, he had devoted practically all his professional time to special treatment, attendance and care of the defendant during his illness. The defendant considered that the amount of the bill was exorbitant and exaggerated and expressed his willingness to pay the sum of $750, which he thought sufficient to indemnify the plaintiff for the services rendered. Judgement was given by Mr. Justice Archer, who ruled that the defendant should pay to the plaintiff the sum of $957, with interest and costs. In rendering judgement, His Lordship said, "When no express

contract for his services has been entered into by the physician and his patient, the learning, skill, and professional standing of such physician must be considered to determine what is a reasonable compensation for his services, and the nature and difficulty of the case may also be considered. In the present case there was no express contract entered into by plaintiff and defendant."

Arrangements have been completed for the erection of a Canadian General Hospital at 6, Gravelle Plateau, near the Bois de Vincennes, Paris. The expense of building this hospital will be borne by the Canadian Red Cross Society and the staff and equipment will be supplied by the Canadian Government. The hospital, which will be known as the Canadian Red Cross Hospital, will contain the usual number of beds for a base hospital, namely, 1,040, and when the war is over will be used by the French army.

A convalescent hospital at Lympe Castle, Hythe, England, was formally opened on October 2nd by Her Royal Highness Princess Arthur of Connaught. The hospital, which is affiliated with the Shorncliffe Military Hospital, is the gift of Mrs. Sandford Fleming who has been assisted by a committee of Canadian ladies at Folkestone in collecting the necessary funds. The castle has been lent by Mrs. Frederic Tennant. Accommodation is provided for one hundred patients.

The following cable was recently received by the Canadian Red Cross Society from His Majesty the King: "The work of mercy jointly carried out by the British Red Cross Society and the Order of St. John of Jerusalem has evoked among my people the deepest feelings of gratitude and pride. From what I have seen at home and at the front I fully appreciate the splendid work the society has accomplished.

As it is only by a united Empire that victory will be assured, so for the relief of those who suffer in its attainment must we stand equally united. I have great pleasure in giving £5,000 as a donation to the fund, upon the resources of which there must be ever-increasing demands."

It appears that on more than one occasion certificates of ill-health have been given to soldiers who wished to prolong their leave, by physicians to whom they applied. The matter came to the ears of the Military authorities in Ontario, who in order to verify the truth of rumours to this effect sent a soldier to a certain physician, who upon the payment of a fee of one dollar presented the applicant with a certificate stating that he was suffering from tonsillitis and unfit for service for a few days. The man was examined carefully before leaving and upon returning to the camp and was found to be perfectly well. The matter has been placed in the hands of the Ontario Council of Physicians and Surgeons.

A timely article on the training of the left hand of cripples which recently appeared in the *Revue Scientifique*, from the pen of Mlle. Josefa Joteyko, a lecturer at the College de France, is of particular interest to those engaged in the vocational education of soldiers who have lost their right arm during the present war. Mlle. Joteyko, who has made a special study of neuromuscular physiology, has attempted to formulate scientific rules for the reëducation of the left hand. The secret of success in such cases seems to be the adoption of the general principle that, since practice acquired by one hand helps the other, and since the body is bilaterally symmetrical, the left hand should be trained to carry out the movements of the right hand in an inverse direction, such movements having been termed "mirror movements". Mlle. Joteyko has found, however, that intensive work of the left hand produces greater strain on the heart than the same

movements made by the right hand. It is concluded, therefore, that the use of the left hand cannot be extended to all trades and that periodic examinations of the heart of such cripples should be made and the work changed when it is found that too great a strain is being placed upon that organ.

An article entitled "Progressive oxidation of cold storage butter," published in the *Journal of Agricultural Research*, contains the results of some experiments conducted by D. C. Dyer, who finds that the development of undesirable flavours in storage butter is not dependant upon an oxidation of the fat itself but that it is attributable to a slow process of oxidation progressing in the non-fatty constituents of the buttermilk and that the extent of this change is directly proportional to the amount of acid present in the cream from which the butter has been prepared. The experiments showed that butter made from sweet cream had a very mild flavour and kept in good condition almost indefinitely in storage, while that made from cream of high acidity had a strong flavour but would not keep well.

The establishment of a museum for the display of ambulance and hospital material, with a view to the study and comparison of the various patterns of apparatus and equipment that are brought forward from time to time and the attainment of a standard as the result of such comparison, is suggested by Sir John Furley in a letter to the *Times*. A scheme for standardizing the various patterns of stretchers and other means of sick transport was submitted by Sir John Furley to the late Lord Wantage several years ago but the proposition fell through, partly because no suitable site was available at the time. The variation in dimensions of the numerous patterns of stretchers in use and the fact that the ambulance carriages are often unable to accommodate the various stretchers from the different units, entails much

suffering on the part of the man who has to be moved from one stretcher to another.

It is suggested that a museum should be opened in London or its suburbs, under the control of a small committee of experts, and that any object or appliance should be exhibited for a year; and at the end of that period it should be removed if, in the opinion of the expert authorities, it had been improved upon or superseded by a subsequent invention, in which case the latter should be substituted for the original appliance under similar conditions. Thus an opportunity would be given for the comparison, criticism and possible improvement of inventions. Moreover, inventions that have been already condemned by competent authorities would not continue to be reintroduced as supposedly valuable improvements by well-meaning persons unacquainted with the practical history of ambulance development.

Sir James Lougheed, chairman of the Military Hospitals Commission, recently stated that no less than six thousand patients had already passed through the twenty-three hospitals established in various parts of the Dominion by the Commission, and that about fifteen hundred soldiers were then under treatment. The men who receive treatment at these hospitals may be divided into three classes: those who are returned from England as unfit for service, the wounded, and those suffering from rheumatism. It is understood that there are at the present time two thousand Canadian soldiers in England who are suffering from rheumatism and arrangements are being made for the establishment of special hospitals for the accommodation of these men, who will be brought to Canada as soon as the hospitals are ready to receive them.

Miscellany

Book Reviews

Blood Pressure: Its Clinical Applications. By George W. Norris, A.B., M.D., assistant professor of medicine in the University of Pennsylvania. Second edition, revised and enlarged. 424 pages, with 102 engravings. Publishers: Lea & Febiger, Philadelphia and New York, 1916. Price $3.00 net.

This book of some four hundred pages is worthy the consideration of clinicians. It is clearly and simply written and brings the important question of blood pressure in its relation to disease before our notice in a most comprehensive and thoroughly up-to-date manner. The first chapter by Dr. Austin reviews concisely the physiology of blood pressure; then follows a very exhaustive account of instruments and methods. The chapters on blood pressure in various diseases are very good and present experimental as well as clinical data. The action of drugs on blood pressure in man is uncertain and many of those formerly used to modify it have lately been shown to be useless. No extravagant claims are made in the few pages devoted to this subject. On the whole the work is a valuable addition to our literature.

Obstetrics, Normal and Operative. By George Peaslee Shears, B.S., M.D., professor of obstetrics and attending obstetrician at the New York Polyclinic Medical School and Hospital. 745 pages with 419 illustrations. Philadelphia and London: J. B. Lippincott Company, 1916.

This is a book about the practice of obstetrics and was written by one who brought to his task an experience of the subject obtained from hospital, private and consulting practice and from teaching both undergraduates and graduates.

While the arrangement of the subject matter is not that usually followed, there cannot be said to be much that is new or original in the author's presentation, with the exception of the treatment of prëeclamtic toxæmia, eclampsia and the toxic vomiting of pregnancy by the administration of oxygen. The author also

claims to have had excellent results from its employment in cases of difficult labour with the object of reducing the infant mortality. He is evidently profoundly impressed with the value of oxygen in obstetrical practice.

Certain portions of the work are unusually excellent, particularly that dealing with the third stage of labour and the chapter on "Fœtal Mortality in Labour."

The discussion of Twilight Sleep is on the whole very complete. After reviewing briefly the history of twilight sleep the author gives in detail the Freiburg method and concludes this portion of the subject by recommending a small dose, "small enough to be without danger to mother or child," of morphine and hyoscine, to be followed later by a second small dose of hyoscine be given. Exact dose is not mentioned. In the second stage this treatment is to be reinforced by the administration of ether by the drop method and only "at the height of a pain", complete anæsthesia being induced as the head is passing over the perineum.

The author's method of abdominal palpation is lacking in method and nearly all else that makes this examination of the pregnant woman so important in diagnosis.

The book is readable and the style unusually simple and well suited to the undergraduate of kindergarten origin.

This work is practical and will no doubt prove popular with the practitioner for in it he will find much that he can put into use with benefit to himself and frequently, no doubt, to the benefit of his patients. From the academic and scientific standpoints the work is decidedly lacking. The illustrations have been exceptionally well selected and form one of the chief attractions of the book, as they may really be said to illustrate important points.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

Diseases of Children. By Edwin E. Graham, A.B., M.D., professor of diseases of children in the Jefferson Medical College. 902 pages with 89 engravings. Publishers: Lea & Febiger, Philadelphia & New York, 1916. Price $6.00 net.

THE TREATMENT OF DIABETES MELLITUS, WITH OBSERVATIONS UPON THE DISEASE BASED UPON ONE THOUSAND CASES. By ELLIOTT P. JOSLIN, M.D., assistant professor of medicine, Harvard Medical School. 440 pages, illustrated. Publishers: Lea & Febiger, Philadelphia and New York, 1916. Price $4.50 net.

INTERNATIONAL CLINICS: A QUARTERLY OF ILLUSTRATED CLINICAL LECTURES AND ESPECIALLY PREPARED ORIGINAL ARTICLES ON TREATMENT, MEDICINE, SURGERY, NEUROLOGY, PÆDIATRICS, OBSTETRICS, GYNÆCOLOGY, ORTHOMOPÆDICS, PATHOLOGY, DERMATOLOGY, OPHTHALMOLOGY, OTOLOGY, RHINOLOGY, LARYNGOLOGY, HYGIENE, and other topics of interest to students and practitioners. Edited by H. R. M. LANDIS, M.D., Philadelphia, and others. Vol. III. Twenty-sixth series, 1916. Publishers: J. B. Lippincott Company, Philadelphia, London, and Montreal.

CARE AND FEEDING OF INFANTS AND CHILDREN: A TEXT-BOOK FOR TRAINED NURSES. By WALTER REEVE RAMSEY, M.D., associate professor of diseases of children, University of Minnesota. 280 pages with 123 illustrations. Publishers: J. B. Lippincott Company, Philadelphia, London, and Montreal, 1916. Price $2.00 net.

SYPHILIS AND THE NERVOUS SYSTEM: FOR PRACTITIONERS, NEUROLOGISTS, AND SYPHILOLOGISTS. By DR. MAX NONNE, chief of the nervous department in the General Hospital, Hamburg. Authorized translation from the second revised and enlarged German edition by CHARLES R. BALL, B.A., M.D., chief of the nervous and mental departments, St. Paul Free Dispensary. 450 pages with 98 illustrations. Second American edition revised. Publishers: J. B. Lippincott Company, Philadelphia, London, and Montreal, 1916.

THE CONTROL OF HUNGER IN HEALTH AND DISEASE. By ANTON JULIUS CARLSON. 319 pages. The University of Chicago Press, Chicago, Ill., 1916. Price $2.00 net.

THE AMERICAN YEAR-BOOK OF ANÆSTHESIA ANALGESIA. Editor, F. H. MCMECHAN, M.D., A.M. 420 pages and 250 illustrations. Surgery Publishing Company, 92 William St., New York, 1916. Price $4.00.

Obituary

Dr. J. H. Gimby, of Sault Ste. Marie, died September 27th. Dr. Gimby had been in practice at Sault Ste. Marie for a number of years and had previously practised at Chesley. He was born at Owen Sound and graduated from Victoria University, Toronto, in 1889.

Dr. Ralph Brodie, of Claremont, Ontario, died September 30th, from the effects of an automobile accident which occurred when he was on his way to visit a patient. Though severely shaken he was able to attend the patient but his death occurred the following day. Dr. Brodie was born in Markham Township in 1864 and was a graduate of Trinity Medical School. He was well known throughout the district of Claremont where he had been in practice for fourteen years.

Lieutenant Edgar H. McVicker, R.A.M.C., who was killed in action on September 9th, was a son of Mr. Samuel McVicker of Toronto, and graduated in medicine from the University of Toronto.

Dr. Thomas Carter, of Flesherton, Ontario, died October 14th. He was born at Schomberg, Ontario, and graduated from Trinity Medical College in 1869. He practised for a time at Sault Ste. Marie and at Markdale, and for the past thirty-five years had carried on a successful practice at Flesherton.

Dr. Heward Yorke who died at Waterford on October 22nd, in the twenty-ninth year of his age, was the son of Lieutenant-Colonel I. E. Yorke, of Waterford. Dr. Yorke took his medical degree at the University of Toronto, and subsequently at the Medical Department of Columbia University, New York. For a time he was resident house surgeon at the Western Hospital, Toronto. Dr. Yorke was a student of great promise and his untimely death is much to be regretted. He was engaged in post-graduate work in New York when his health broke down.

Dr. Otto B. Moore, of Bathurst, New Brunswick, died on October 9th. He had been in practice at Bathurst since 1902 and

his kindly manner and sterling character had won for him hosts of friends.

Dr. Samuel Watson McConochie who died at Hamilton on October 11th was born in Scotland in 1858, and came to this continent with his parents at an early age. The family lived for a short time in Wisconsin and from there moved to Bowmanville, Ontario. Dr. McConochie graduated from Trinity Medical College in 1883 and subsequently did post-graduate work in England. He returned to Canada and went into practice at Hamilton. A few years ago he was obliged to give up professional work on account of failing health.

News

ONTARIO

No cases of smallpox were reported in the province of Ontario during the month of September. The fact is worthy of record since it is the first time in twenty-two years that a month has passed without any cases of this disease being reported in the province. Other cases of infectious disease reported during the month of September were: diphtheria, 266 cases, 35 deaths; typhoid fever, 196 cases, 17 deaths; scarlet fever, 30 cases; measles, 94 cases; whooping cough, 181 cases, 9 deaths; tuberculosis, 151 cases, 78 deaths; infantile paralysis, 76 cases, 7 deaths; cerebro-spinal meningitis, 10 cases, 8 deaths.

Dr. H. A. Beatty, of Toronto, has been appointed chief surgeon and medical officer of the Canadian Pacific Railway. Dr. Beatty graduated from Toronto University in 1897 and subsequently did postgraduate work in London, Edinburgh, and Vienna. He became house surgeon at the Poplar Accident Hospital, London, and later senior house surgeon at Westminster Hospital. He has been connected with the Canadian Pacific Railway since 1902, and in 1910 was appointed chief surgeon and medical officer of the Eastern lines of the system.

The annual meeting of the board of directors of St. Luke's Hospital, Ottawa, took place on October 11th. During the year

ending September 30th, 1916, 2,652 patients were admitted to the hospital; 73 deaths occurred.

FORTY-SIX cases of rabies have been reported in the province during the six months elapsing from March to the end of September. The matter has been taken up by the Provincial Board of Health and arrangements have been made to give the Pasteur treatment free of charge in cases of suspected hydrophobia.

A HOSPITAL is to be erected at Kitchener by the Sisters of Charity. It will be known as the St. Mary's Hospital and have accommodation for about fifty patients. A training school for nurses will be established in connexion with the hospital.

THE formal opening of the addition to the St. Joseph's Hospital at Hamilton took place on October 12th. The new building has been carefully planned and is fitted with every modern improvement. It is capable of accommodating 36 public and 24 private patients and is provided with four protected sun-rooms and an open air balcony.

QUEBEC.

THE formal opening by His Royal Highness the Duke of Connaught of the Ross Memorial Pavilion of the Royal Victoria Hospital, Montreal, took place on Wednesday afternoon, October 11th, in the presence of a large gathering. His Royal Highness, who was accompanied by Their Royal Highnesses the Duchess of Connaught and the Princess Patricia, expressed his regret upon leaving the Dominion and his appreciation of the privilege of opening such an institution as the Ross Memorial Pavilion. The Pavilion has been erected and equipped by Mr. John Kenneth Leveson Ross, of Montreal, in memory of his father, the late James Ross, and of his mother, Anne Kerr Ross. It provides accommodation for one hundred and twenty-five private patients and is provided with an ambulance court which will enable patients to be brought direct to the building. It is connected with the administration offices of the Hospital by a tunnel and a shaft which was blasted in the solid rock fifty feet below the ground floor. Since the new building is intended to accommodate private patients only, the private wards in the Royal Victoria Hospital will be converted into public wards and the private patients removed to the Pavilion.

An interesting feature of the Military Benefit which recently took place in the Montreal Arena under the auspices of the Soldiers' Wives' League was an exhibition of articles made by wounded soldiers at the Grey Nunnery Convalescent Home. Classes were commenced on September 1st at this Home in which instruction was given in mechanical drawing, carpentering, shoemaking, motor mechanics, commercial subjects, civil service, English and French.

An excellent year's work was reported at the eighth annual meeting of the Montreal Association for the Blind. The financial statement, however, showed that subscriptions had fallen off somewhat during the year.

The annual meeting of the Laurentian Society for the Treatment and Control of Tuberculosis took place at Montreal on October 26th. During the year over a hundred soldiers suffering from tuberculosis have received treatment at Ste. Agathe in addition to the regular patients. A number of beds fully equipped for the use of such soldiers were presented to the society by the Abbottsford Machine Gun Association and the total number of cases treated during the year amounted to 196 as compared with 129 during the previous year. Within the last eight years 437 patients have been discharged and it is encouraging to learn that from available records of 90 per cent. of these cases, 52 per cent. are living and well. Of the remainder, 17 per cent. are still invalids and 21 per cent. are dead. A charge of $8.00 a week is made, but the actual cost of maintenance during the year was $10.78 a week for each patient who received treatment, as compared with $11.27 during the previous year. The society's debt at the close of the year amounted to $69,906.75 and the hope was expressed by Mr. D. Lorne McGibbon, the president, that a special effort might be made to wipe off this debt. The vice-president, Dr. Hugh M. Kinghorn, referred to the splendid work being done by Dr. J. R. Byers, the medical superintendent of the sanatorium. He mentioned also the need of an *x*-ray machine and a free bed fund which would enable a patient to complete his cure should his means run out when a few more months in the sanatorium would cure him. Mr. McGibbon referred to the deep sense of loss which all the members of the society felt in the sudden death of Mr. Fayette Brown and a resolution of sympathy to Mrs. Brown and family was passed. Mr.

C. W. Lindsay, of Montreal, was elected to the Board of Governors in succession to the late Mr. Brown.

A STATEMENT has been issued by the Quebec Provincial Branch of the Canadian Red Cross Society of the manner in which the monies received during the two years ending July 31st, 1916, have been expended. Including a balance on hand of $944, the receipts amounted to $302,814.21. Materials, including medical supplies and comforts, to the amount of $190,243.25, were purchased and the cost of packing cases, etc., and freight came to $8,833.05; expenses in connexion with collecting and shipping 1,830 lbs. of maple sugar and 527 gallons of maple syrup were $362.49; administration expenses were $8,906.25; and cash contributions to the amount of $38,000.00 were made to headquarters. Other contributions made by the Branch were: Cliveden Hospital, $12,996.00; motor ambulance fund, $5,588.33; prisoners of war fund, $5,310.10; emergency bureau, $1,000.00; specified donations, $7,973.11. The statement closed with a balance on hand of $21,151.55.

THE St. Elizabeth Hospital at Farnham was completely destroyed by fire on the night of October 25th. At the time there were 218 people in the building, including 113 children, 36 old men and 37 old women. The hospital was in charge of the Grey Nuns; it was an old building but was considered to be sufficiently provided with fire escapes. Heroic efforts were made by the Sisters in charge and by a number of voluntary helpers, but as all the electric lights were out it was impossible to get everybody to the windows in time and seventeen lives were lost. The unfortunate occurrence is said to have been caused by a short circuit due to defective electric wiring. The fact that a fire broke out in a chimney in the hospital on the previous night, which fortunately was quickly extinguished, and that a number of fires have occurred in the neighbourhood of Farnham has given rise to stories of incendiarism but it is more probable that the hospital fire was caused by a defect in the electric wiring.

ALBERTA

THE following candidates have been successful in passing the medical examinations recently held at the University of Alberta: Herbert Russell Baines, of Moose Jaw, Saskatchewan; Harland Everett Dice, of Magrath, Alberta; Alfred Clayton Greenaway, of

Lethbridge; George Arthur Edward Kelman, of Lougheed, Alberta; and Thomas J. Rousseau, of Sylvan Lake, Alberta.

The Sacred Heart Hospital at Athabasca was destroyed by fire on October 8th. The fire was caused by the explosion of a lamp and, unfortunately, resulted in the loss of three lives—a blind and paralysed old lady of fifty-nine and two children of nine and fourteen years respectively. The hospital was a frame building and contained thirty beds.

Dr. Edgar W. Allen, of Edmonton, was elected second vice-president of the Clinical Congress of Surgeons of North America at the meeting of the Congress which took place at Philadelphia on October 26th.

SASKATCHEWAN

The following have been elected members of the College of Physicians and Surgeons of Saskatchewan: Dr. Johnson of Regina; Dr. Peterson of Saskatoon; Dr. Argue of Grenfell; Dr. Eaglesham of Weyburn; Dr. Miller of Battleford; Dr. Waddell of Moose Jaw; and Dr. Irvin of Yorkton.

A grant of $50,000 has been made to the British Red Cross Society by the Saskatchewan Government.

BRITISH COLUMBIA

The sum of $40,000 has been bequeathed to the Vancouver General Hospital by the late Mr. J. B. Graves, of Kamloops.

An outbreak of typhoid recently occurred in St. Ann's Convent, Victoria.

MEDICAL COLLEGES.

Toronto University.

Dr. Alexander Primrose, secretary of the Faculty of Medicine, has returned to Toronto and has resumed his duties at the University. Lieutenant-Colonel Primrose has been in command of the surgical department of the Toronto University Base Hospital at Salonica. Dr. J. J. Mackenzie, professor of bacteriology and pathology, and Dr. B. P. Watson, professor of obstetrics,

have also returned from Salonica and have resumed their academic duties. Dr. Irving Heward Cameron, professor of surgery, has also returned after a year's service as chief of the surgical wards in the Ontario Military Hospital at Orpington, Kent, England.

Captain Stewart McKeough, whose death occurred in action last September, was a son of Dr. W. E. McKeough of St. Thomas, Ontario. Captain McKeough was studying medicine at the University and was in his third year when he joined the 18th Battalion with the rank of lieutenant. He was twenty-three years of age.

It was decided at a meeting of the Senate of the University which took place on October 13th, that the course of study for undergraduates in medicine shall comprise six college sessions instead of five as at present, the change to come into effect in July, 1918.

McGill University.

The enrolment in the medical faculty of McGill University is about the same as last year, the actual number of students who have registered for this session being as follows: first year, 68; second year, 62; third year, 63; fourth year, 70, fifth year, 64. In the dental faculty 34 students have registered for the session.

A medical society which meets once week has been formed by the medical students on duty in France with the McGill General Hospital. Colonel H. S. Birkett, commanding officer of the hospital, has been elected honorary president. Arrangements are being made for a series of lectures to be given before the society.

Dalhousie University.

Professor Fraser Harris, M.D., D.Sc., of the chair of physiology at Dalhousie University, Halifax, has been reëlected by the Senate of the University as representative on the Medical Council of Canada for a period of four years from June, 1917.

ARMY MEDICAL SERVICES.

The decoration of the Legion of Honour has been conferred by the President of France upon Surgeon-General Guy Carleton Jones, C.M.G., C.A.M.C., Director of the Medical Services of Canada.

Dr. George E. Armstrong, chief surgeon of the Royal Victoria Hospital, Montreal, has been appointed consulting surgeon to the Canadian Expeditionary Forces with headquarters at London. Dr. Armstrong takes the military rank of Lieutenant-Colonel.

Colonel G. G. Nasmith, C.M.G., whose splendid work in connexion with the sanitary services of the Canadian Expeditionary Forces, first at Valcartier and later in Flanders, is well known, has resigned his commission and will resume his duties in Toronto as director of the laboratories of the health department.

Announcement is made of the appointment of Lieutenant-Colonel Charles A. Peters, C.A.M.C., of Montreal, officer commanding No. 9 Field Ambulance, as assistant director of Canadian medical services in England.

Lieutenant-Colonel Wilson, A.D.M.S., at Shorncliffe, has been appointed deputy director of the Canadian Army Medical Services at London in succession to Lieutenant-Colonel Murray Maclaren.

The resignation of Lieutenant-Colonel J. McCombe, A.D.M.S. of Canadian forces in the London district, is announced, and the appointment to this position of Lieutenant-Colonel Watt, of Winnipeg, at present commanding officer of the Granville Canadian Special Hospital at Ramsgate.

A committee on orthopædics has been appointed by the Military Hospitals Commission to consider the matter of artificial limbs for soldiers. The members of this committee are Dr. Clarence L. Starr, of Toronto, Dr. William E. Gallie, of Toronto, and Lieutenant-Colonel A. Mackenzie Forbes, C.A.M.C., of Montreal. Dr. Frederick E. Thompson, the medical superintendent of the Commission, and Dr. Francis J. Shepherd, of Montreal, will be ex-officio members of the committee.

Dr. Hadley Williams, of London, Ontario, has been given the command of the Ontario Military Hospital at Orpington, with the military rank of Lieutenant-Colonel. Dr. Williams is a member of the medical faculty of Western University and chief of the surgical department of Victoria Hospital, London, Ontario.

The Military Medal has been awarded to the following members of the Canadian Army Medical Corps: Sergeant F. Cameron, Sergeant A. W. Board, and Corporal H. Martin.

The Military Cross has been awarded to Lieutenant George Boyd MacTavish, R.A.M.C., who "through energy and courage and contempt for danger was responsible for saving a large number of severely wounded left in the battered front trenches or in 'No Man's Land.'" Lieutenant MacTavish transferred from the Canadian Army Medical Corps to the Royal Army Medical Corps.

Colonel F. W. Marlow, who was recently appointed Chief Medical Inspector of the Canadian Expeditionary Forces, has completed a tour of inspection of the military camps in this country.

Captain F. A. Aylesworth, of Toronto, has been given charge of the ophthalmic department of the Harvard Base Hospital, which is now in France. Captain Aylesworth sailed from New York on October 5th.

Dr. Evelyn Windsor, who has been in charge of the medical department of the Calgary schools since the department was opened, has joined the Canadian Army Medical Corps and has left Canada for England. Dr. Windsor is the first woman physician to receive an appointment with the Canadian Army Medical Corps.

Dr. McEwen, of Similkameen, British Columbia, has left for overseas service.

Major Louis McNutt, of Charlottetown, Prince Edward Island, has been appointed commanding officer of a convalescent hospital for Canadian officers in London.

Colonel Roderick C. McLeod, commanding officer of the St. Francis Xavier Hospital unit, has been placed in command of the Bramshott Hospital.

Captain F. B. Bowman, C.A.M.C., has been placed in command of No. 2 Canadian Mobile Laboratory which is stationed at Folkestone, England.

Captain W. Black has been appointed medical officer of the 251st Battalion.

The following practitioners have been appointed to the staff of the new military hospital at Toronto: Dr. William B. Thistle, chief of the medical service; Dr. Charles B. Shuttleworth, chief of the surgical service; and Dr. Goldwin W. Howland, chief of the neurologic service. Other members of the staff are: Dr. Gordon Bates, Dr. Archie C. Campbell, Dr. Charles E. Treble and Dr. Albert G. Fleming.

The Military Medal has been awarded to the following members of the Canadian Army Medical Corps: Sergeant-Major W. Keith, Corporal L. H. Mansell, and Private J. E. McGillivray. Corporal H. T. Lord, of the Canadian Ambulance Corps, has also received the Military Medal.

The Canadian Red Cross Society has taken over the St. Lawrence College at Ramsgate, England, and is converting it into a convalescent hospital of one thousand beds. The Princess Patricia Hospital, as it has been named, when the alterations are completed will be handed over to the Canadian medical authorities, by whom the staff will be appointed.

An enquiry was recently made into the conduct of the Toronto Base Military Hospital, which is under the command of Colonel Thomas B. Richardson. It was found that the patients—of whom over 9,000 have been treated—received every attention and that the medical arrangements were quite satisfactory. It has been decided that in future a complete quartermaster's staff will be appointed in connexion with base hospitals.

The position of commandant of the Duchess of Connaught Canadian Red Cross Hospital at Cliveden has been offered to Lieutenant-Colonel John Stewart, C.A.M.C., of Halifax, who is now in command of the Dalhousie University Hospital. Colonel C. W. F. Gorrell, C.A.M.C., of Ottawa, who has been in command of the Cliveden Hospital since it was established, is returning to Canada.

It is announced that Colonel P. B. Mignault, C.A.M.C., will return shortly to Canada to assume a new military command and that Major Décarie, second in command of the Laval University

Hospital, will succeed Colonel Migneault as commandant of that unit.

Captain W. H. Eagar, C.A.M.C., medical officer of the 2nd Divisional Ammunition Column, has been invalided to Canada for three months. Captain Eagar sustained an injury to the hip in July last and has been in hospital since then.

The following promotions in the Canadian Army Medical Corps are announced: To be Lieutenant-Colonels: Major A. B. Osborne, of Hamilton, and Major C. H. Gilmour. To be Majors: Captains G. P. Howlett and H. Smith. To be Captain: Lieutenant A. D. Dyas. To be temporary Captains: N. B. Taylor, D. W. Davis, and W. S. Macdonnell (late temporary lieutenants R.A.M.C.), H. E. H. Chipman, M. S. Inglis, Captain A. N. Aiken, F. R. Nicolle, W. E. Campbell, and Sergeant C. H. Hudson, from the 99th Canadian Infantry Battalion. Major C. Laviolette has relinquished his temporary commission.

The Distinguished Service Order has been conferred upon Major Philip Burnett, C.A.M.C., who is on duty in France with No. 6 Field Ambulance. Major Burnett took his medical degree at McGill University in 1900.

A branch of the Association of Military Surgeons has been formed at Bramshott Camp, Hampshire, England. At present there are about sixty medical men from all parts of Canada stationed at this point. The officers are: honorary president, Colonel Drum, A.D.M.S., of Bramshott Camp; president, Captain J. Graham, of Mona Road, Ontario; vice-president, Major, A. A. Dickson, of Hampton; secretary-treasurer, Captain G. M. Hanna, of Brantford, Ontario. Weekly meetings are held which have proved most interesting, and at the first meeting in October an address on "Intestinal stasis" was delivered by Sir Arbuthnot Lane. The following week Colonel Finley, of Montreal, gave a most instructive address on cerebro-spinal meningitis. Major H. E. Kendall, senior physician, and Lieutenant-Colonel C. H. Gilmour, senior surgeon of the Bramshott Hospital, show interesting cases from the wards of the hospital at each meeting.

The Bramshott Military Hospital was officially taken over from the Imperial authorities by the Canadian Army Medical

Corps on October 2nd, when No. 9 Stationary Hospital, from Nova Scotia, was placed in charge. The staff was increased by the addition of several officers and twenty-five nursing sisters. The hospital, which has accommodation for seven hundred patients, has an equipment which is perfect in every detail. The officer in command is Lieutenant-Colonel R. C. McLeod, of North Sydney. Other members of the staff are:—senior surgeon, Lieutenant-Colonel C. H. Gilmour, of Toronto; assistant surgeons, Captains K. A. McCuish of Glace Bay, J. A. McCourt of St. John, New Brunswick, and Webb, of Scranton; senior physician, Major H. E. Kendall of Halifax, registrar of the Nova Scotia Medical Council; assistant physicians, Captains L. D. Dinsmore, J. F. Ellis, T. A. Libbetter and A. H. McKinnon; pathologist, Captain A. R. Campbell of Yarmouth, Nova Scotia; *x*-ray specialist, Captain J. I. O'Connell of Newfoundland; eye, ear, nose and throat specialist, Captain J. G. Sutherland of St. Catharines, Ontario. Miss McIsaacs, of St. John, New Brunswick, is matron of the hospital and has a staff of sixty nursing sisters.

The following account of the death of the late Lieutenant-Colonel R. P. Campbell, officer commanding the Sixth Field Ambulance, is given in the *British Medical Journal*. "During the three days' operations beginning on September 15th, he was placed by his A.D.M.S. in charge of the clearing of the ground in the, front area, and to quote that A.D.M.S. (Colonel Fotheringham), 'With his usual sense of duty and disregard of personal safety he was well up with the advance on the morning of Saturday the 16th, . . . trying to estimate the situation for himself rather than to depend upon information from regimental medical officers and bearers.' It was here, just after dawn, when conducting a group of bearers towards safety, that a shell exploded and a fragment fractured his right arm, while another penetrated his chest. Borne back to a dug-out he there refused to be treated, directing that others whose wounds were not hopeless should be looked after, he died within half an hour of internal hæmorrhage."

Lieutenant-Colonel Campbell was mentioned for gallant and distinguished conduct in the field, in Sir Douglas Haig's dispatch of June 15th.

CASUALTIES

Killed in Action

Captain Stanley Arthur Walker, R.A.M.C., who was transferred from the C.A.M.C. in November, 1915.

Captain Dugald B. MacLean, R.A.M.C. Captain MacLean was twenty-five years of age and graduated from the University of Toronto in 1914.

Wounded

Major G. S. Mothersill, C.A.M.C., of Ottawa.

Captain Hugh Roy Mustard, C.A.M.C., of Victoria, British Columbia.

Captain R. E. Horkins, C.A.M.C., attached to Royal Field Artillery.

Captain J. J. Field, R.A.M.C., transferred from C.A.M.C. last May.

Captain H. Hart, C.A.M.C.

Captain R. R. McClenahan, C.A.M.C.

Captain B. E. Kelly, C.A.M.C.

Captain W. L. Whittemore, C.A.M.C.

Captain N. J. Barton, C.A.M.C.

Lieutenant G. B. Ferguson, R.A.M.C., who was gazetted from the C.A.M.C. last June.

Lieutenant W. J. Grant, R.A.M.C., of Georgetown, Prince Edward Island, transferred from C.A.M.C. last May.

Lieutenant R. R. Scott, R.A.M.C., transferred from C.A.M.C. last May.

Canadian Literature

Original Contributions

The Canadian Practitioner and Review, August, 1916:

The ætiology and treatment of exophthalmic goitre with special reference to the use of radium . . .	W. H. B. Aikins.
The quarantine period for measles . .	M. B. Whyte.
Rural sanitation	Major P. J. Maloney.

The Canadian Practitioner and Review, September, 1916:

Foreign bodies in the œsophagus . .	E. Boyd.
Municipal collection and disposal of domestic wastes	F. A. Dallyn.

Dominion Medical Monthly, August, 1916:

Drugs and medicinal agents considered from the professional, economic, and national standpoints . . . A. D. Blackader.

Dominion Medical Monthly, September, 1916:

The treatment of diabetes mellitus . . E. P. Joslin.

Medical Societies

MANITOBA COLLEGE OF PHYSICIANS AND SURGEONS

An election was held on September 23rd to elect members of the council of the College of Physicians and Surgeons of Manitoba. The representatives are chosen every three years. The following members were elected on the new council:

Winnipeg: Dr. W. G. Campbell, Dr. T. Turnbull, and Dr. Coulter. Brandon: Dr. Wright. Selkirk: Dr. Ross. Marquette: Dr. Leishman. Dauphin: Dr. Harrington, M.P.P. Souris: Hon. Dr. Thomas, M.P.P. Portage La Prairie: Dr. Rennie.

Representatives from Manitoba Medical College: Dr. Gray, Dr. McCalman, and Dr. W. Rogers.

Homeopathic Representative: Dr. Sugden.

A meeting of the new council was held on October 11th in Winnipeg, and the following were elected officers:

President, Dr. Harrington; vice-president, Dr. Turnbull; registrar, Dr. Gray; treasurer and assistant registrar, Dr. Coulter.

Representatives to Manitoba University: Dr. Gray, Dr. Rogers, Dr. Campbell and Dr. McCalman.

Representatives on Dominion Medical Council: Hon. Dr. Thornton, M.P.P., and Dr. Wm. Rogers.

$2,000 was granted to the Red Cross Fund.

ALBERTA MEDICAL SOCIETY

The eleventh annual meeting of the Alberta Medical Society took place at the University of Alberta, Edmonton South, on September 21st and 22nd, and in spite of the conditions incidental

to the war was the most successful meeting ever held by the Society. The papers presented were of particularly high order and the attendance was well sustained throughout, sixty-six members of the Society and a number of visitors being present. The presidential address, the text of which appears in this issue, was delivered by Dr. T. H. Whitelaw, of Edmonton. Strict adherence was made to the programme, which was both interesting and varied.

The question of Imperial reciprocity was brought up by Dr. John Park, of Edmonton, who strongly advocated the establishment of reciprocal relations between the province of Alberta and Great Britain. The matter was warmly discussed and a resolution passed that the provincal legislature be requested to take the necessay steps to bring about such reciprocity. Another important matter that came up for consideration was the establishment of rural hospitals and a resolution of approval of the efforts now being made to extend the hospital accommodation of the province was passed, the society expressing its willingness to coöperate in any steps taken to improve the hospital facilities in the country districts of the province. The establishment of cottage hospitals which should be managed by a local committee and be as self-supporting as possible was recommended. The society was of opinion that present hospital accommodation in the cities was adequate for the needs of the population and that the present system of management was designed to give the best service to the community as a whole. A strong protest was made against certain misrepresentations of the management and service of the hospitals of the province.

The subject of public health, and particularly the physical and mental condition of the child, was taken up in a paper prepared by Dr. T. J. Norman, provincial health officer, and read by Dr. Jamieson, and in a paper entitled "The early diagnosis of mental deficients," by Dr. F. W. Stockton, of Calgary. Dr. Dunn, medical inspector of schools at Edmonton, also referred to the same subject. After hearing the views of these speakers, the society passed a resolution asking the executive committee to appoint a special committee to conduct an investigation and inquire into the causes of the present unfavourable conditions. It was decided also that pamphlets containing information and statistics should be prepared for general distribution and that the Medical Council of the province should be requested to make a grant to assist in the publication of literature and the work of the committee.

The next meeting will be held in Calgary under the presidency

of Dr. W. A. Lincoln. Dr. D. G. Revell, of Edmonton, was elected permanent secretary-treasurer of the association.

PETERBOROUGH MEDICAL SOCIETY

The first meeting of the Peterborough Medical Society for the years 1916-17, was held on October 20th, with Dr. F. C. Neal, president, in the chair. An interesting paper was read by Dr. John Phillips, associate professor of medicine, Western University, Cleveland, entitled "Colon Bacillus, Infections of Urinary Tract and other Organs." The discussion which followed was opened by Dr. McNulty, and carried on by Drs. Moir, Amys, Ford and Harvey. A hearty vote of thanks to Dr. Phillips was proposed by Dr. Halliday, seconded by Dr. Carmichael.

The next meeting of the society will be held on November 16th, when Dr. Goldwin Howland, of Toronto University, will give the paper of the evening.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The fifteenth regular meeting of the society was held Friday evening, May 5th, 1916, Dr. F. A. L. Lockhart, president, in the chair.

Exhibition: New instruments for tonsillotomy, by Dr. E. H. White.

Case Reports: (1) Uterus didelphys with severe dysmenorrhœa, by Dr. W. W. Chipman. My only excuse for offering this case report is its rarity. The condition is extremely rare and for that reason is perhaps of not very much clinical interest; it has a certain embryological interest which I think will appeal to anyone. The case is a case of double uterus or uterus didelphys. The condition is extremely rare for I see that Pfannenstiel, in 1905, had collected only eighteen cases in the whole literature. In the usual case you have always two uteri, opening by two ora into a single vagina. It is really the condition that you get in the rat and in the rabbit. In the carnivora there is only one os, but you have a bicornate uterus above. With higher development you get a more complete approximation of the ducts of Müller, until in the human species these fuse completely below the crossing of the round ligaments to form a single cavity, the uterus and the vagina, and above that level they remain separate as the oviducts or the Fall-

opian tubes. In uterus didelphys fusion has not occurred above the level of the external os and you have the two ducts remaining separate as the uterus and the Fallopian tube, each with its own separate os. This double uterus has been recorded in about eighteen cases and, as you can understand, it may account for those peculiar instances where the mother, though pregnant, goes on menstruating every month; being pregnant in one uterus she menstruates in the other and may give birth to one child in June and another in September. The woman has had possibly a uterus didelphys. The condition then results from the non-union or non-fusion of the mid- or uterine portion of Müller's ducts; these ducts remain separate down to the level of the vagina, each uterus has a separate os and this gives us the condition found in the rat or rabbit. Arrest of development as found in the human represents a full development as found in the lower mammalia. In the human the ducts of Müller fuse at the eighth week and the septum between the tubes breaks down and gives us a single tube at the end of the third month. Speaking generally the parts of the genital tract are assembled at the twenty-third week of intra-uterine life and they continue to grow till the twenty-third year. In this connexion I may say that a young practitioner is often asked when should a girl marry and if he answers correctly he should say of many 'never'; but of the fit he should say in the twenty-third or twenty-fourth year. In the uterus didelphys we have to deal with arrested development. The rodent stage persists; and we have usually associated with the arrested development imperfect growth.

In the case in question we have both the arrested development and the imperfect growth. The two uteri are separate and distinct and of course they are very small. There is no vagina below. It was represented simply by a band of ordinary connective tissue, extending down to the vulvar depression. The urethra was well placed, the bladder healthy and normal, the perineal body of good size, and there was no vagina. As you can see in the specimen the oviducts or tubes are well developed, of good musculature, and the girl was possessed of two large and active ovaries in the left one of which there was a well developed corpus luteum, showing that while she ovulated, and evidently regularly, there was no apparatus to menstruate from. The girl herself was well developed with well-marked feminine characteristics; build, breasts, epilation, vulva, all of which were normal in every respect.

The clinical history is that of a well-developed girl of sixteen;

the family history shows a definite neurosis, almost a question of mental instability, especially on the mother's side. An older sister suffered from the extreme dysmenorrhœa and scanty menstruation of an infantile uterus.

The patient consulted me about a year ago as to the fact that although she was fifteen, she had never menstruated. Such a history is of course not uncommon, as in this country very frequently menstruation does not appear until that age.

The correct procedure, however, was to make a careful rectal examination in order to make sure that there was no damming back of the menstrual fluid. This was done and through the rectum I felt simply a rim of tissue where the uterus should have been and then a small body running upward on either side which I found difficult to identify. As she did not complain of pain there was no treatment for this delayed menstruation. A year later she came back complaining of acute dysmenorrhœa, the pain occurring regularly about every four weeks, being of a spasmodic character lasting for three days, and felt in the genital sphere; in the intermenstrual interval she had no pain whatever. This dysmenorrhœa had begun six months before, had come on gradually and was getting more and more severe. Her physician deprecated very much the use of sedatives but reluctantly was compelled to give her morphia, and she was finally sent to me to see if something could not be done to relieve the pain. After examination I opened the abdomen and found the condition that I show you here, a double uterus with no vagina. The removal of the tubes and the two uteri removed the cause of her dysmenorrhœa, the ovaries I left behind as they have nothing to do with the dysmenorrhœa which is associated with lesions of the Fallopian tube or of the uterus. Since the operation two menstrual periods have elapsed and there has been no pain.

What is the cause of the pain in this case? The ovarian hormone determines a monthly congestion, in a monthly flux of blood to the Müllerian tract. As we have seen, this was imperfectly grown and contained too much fibrous tissue. Consequently it was non-elastic and thus the nerve elements in it were subject to great pressure and so was produced the spasmodic pain. The case is a rare one and is extremely interesting from an embryological point of view as showing arrested development, arrested at the stage of the rodent, poor growth, with the formation of no definite uterine cavity, and no vagina. The girl remains well in every way, with two ovaries that are active but with no vagina. Concerning

her future it may be said that she is in every way a woman and may marry provided of course the whole condition is explained to the proposed husband.

Discussion: Dr. D. F. Gurd: I would like to know if it was noted in the eighteen cases collected by Pfannenstiel if there was an absence of the vagina in most of them or was this case singular in that respect?

Dr. F. A. L. Lockhart: We are all very grateful to Dr. Chipman for bringing this interesting case before us to-night. I can only partially reply for Dr. Chipman by stating that where you have one faulty development in the female genital tract you usually have others. In my twenty-five years' experience I have not seen a case at all approaching the one reported to-night. I had one case of a woman in whom the uterus was normal except that it had a slight depression at the top and the trouble for which she came to me was that she had had a series of miscarriages at about the fourth month. I started to curette on account of an endometritis and discovered an obstruction in the interior of the uterus dividing the cavity into a right and left half. I explained the condition of affairs and opened the abdomen. I had to split the uterus down and remove the septum, which was simply a persistence of the walls of the Müller's ducts, and united the uterine walls again by a continuous catgut suture inverting the peritoneum by a series of mattress sutures of the same material. She has since presented her husband with a fine sturdy boy.

Dr. M. Lauterman: If Dr. Grant Stewart were here he would recall Hænckl's having given us a field day when among other things he had three cases of uterus didelphys. As far as I can recall, he had these three cases under observation for years; one girl was pregnant at the time. Dr. Chipman emphasized two important facts in connexion with this case; one is that the dysmenorrhœa is not in any way associated with the function of the ovary, the other is the advice he gives to speak to these patients in a sane and straightforward manner, lack of which may be responsible for putting such a patient into a sanitarium or even worse.

Dr. W. W. Chipman: I can only say in reply to Dr. Gurd that looking up the report of Pfannenstiel this afternoon, I found that he said that in some of the cases there was a single vagina, but did not say in how many; and in other cases there was the double, or marsupial, vagina; in others the vagina was absent; the proportion, however, was not given. The question of dysmenorrhœa is always an interesting one and the condition here seems to throw light on

the cause of it in many of these small uteri with acute anti-flexion we so often meet. The pathology in the past has frequently enunciated that the flexion has been the cause of the pain, that is, that the blood cannot get freely out of the uterus. This case, however, shows us that it is not a question of the blood being able to get out of the uterus, but rather of being able to get into it.

(2) Appendico-Vesicular Fistula, by Dr. M. Lauterman. This case report was published in the October number of the JOURNAL.

PAPER: The paper of the evening was read by Dr. Geo. Hall on Pituitary in General Practice and was illustrated by specimens of the gland and the different preparations ready for administration, together with microscopic slides.

DISCUSSION: Dr. H. S. Shaw: The discussion of this subject brings me to my feet with a feeling of gratitude that I have met pituitrin. My obstetric work has been very greatly helped by my having met this substance, and the many drawbacks of doing much obstetrical work, the uncertain hours, the long periods away from home, have become almost things of the past. I have been using it for probably three years pretty frequently, and I always have it with me. In that time I have had only one unfavourable experience—one post-partum hæmorrhage followed its use; how to account for it I do not know, but am not yet prepared to blame pituitrin. However, in studying over this case I felt that ergot might have a steadying effect after the use of pituitrin. I had rather dropped ergot as a routine after the delivery of the placenta, but I now give it regularly after using pituitrin and I think it has been of some service, which seems to bear out the experience mentioned by Dr. Hall.

Dr. M. Lauterman: Dr. Hall has covered the subject so completely that there is little left to say except to express one's appreciation and recite whatever experiences one may have had with the preparation. I do not do obstetrics but I have used it in two or three of the conditions that Dr. Hall has referred to. I had occasion to use it after prostatectomy for suppression of urine; there was absolute fall of blood pressure, lack of tone and general shock. I can confirm what Dr. Hall says about not finding it necessary to catheterize patients after having used pituitary. In lack of intestinal tone I have also had satisfactory results. I was glad Dr. Hall referred to the use of saline; this is an important fact and its use is improved or benefitted by the aid or addition of pituitary. We get the combined effect of the two.

Dr. W. W. Chipman: I have been very much interested in

Dr. Hall's paper. He has gathered together and given to us our present-day knowledge of the use of pituitary. I do not see that he needs in the least to apologise. I have often felt that what this Society needs is more interest taken in it by the general practitioner and I should like very much each year to see at least two papers given by the general practitioner. As regards the use of pituitary I am reminded of a story of an interview with Jellinghaus of the New York Lying-In Hospital when he was asked if he ever used it. "I always use it," he said, "I want to know first if there is anything in the way of the child coming into the world, if not, and the drug is indicated, I give 1 c.c. of pituitary." Like other drugs, it is not always efficacious. I have given it a number of times where as far as I could see I might as well have given salt and water. You find patients who do not respond to its exhibition, but these are the exceptions. As regards its use in obstetrics, the great thing is to see that there is no obstruction; that the soft parts are well dilated and that there is no disproportion in the size of the head.

I remember one case where a rupture of the uterus followed the administration of 1 c.c. of pituitary. There was no uterine storm, no uterine spasm at all and yet a rupture of the uterus occurred. Accordingly it is always to be used with care. As Dr. Hall has so well pointed out, its use has become more or less general and it has passed already into the class of permanent and useful drugs. I have found it very useful in uterine hæmorrhage, menorrhagias; ½ c.c. of pituitary given at intervals of eight hours will control the hæmorrhage in my experience when nothing else will. I never give 1 c.c. of pituitary to a patient who has never had it before; I always give first ½ c.c. because of a certain risk of its toxicity. In one case even ½ c.c. produced most alarming symptoms. The patient was a young woman aged twenty-eight, whose uterus I had curetted once for a definite hyperplasia of her endometrium. She menstruated moderately for one year and then gradual recurrence of her menorrhagia had taken place. I suggested the use of pituitary and Dr. McCallum very fortunately gave her only ½ c.c. of the drug, and after ten minutes he left the house. Five minutes later I received a telephone call from the mother saying her daughter was very ill and would I come at once. I found that a few minutes after Dr. McCallum had left the house the patient felt as if her bowels wanted to move and on getting to the bathroom, fell in a dead faint, where her mother found her. The pulse rate was 30, she was cold, with peculiar cyanosis; the pupils were dilated, there was intense pain in the back, the hands and jaws were clenched.

The picture was that of strychnine poisoning. Hot water bottles were applied to the back, rubbing resorted to and the condition gradually passed off; but I shall never forget the toxic effect of that ½ c.c. of pituitary and what might have happened if she had had the usual dose of 1 c.c. As regards its dosage, therefore, it is always wise to give ½ c.c. if the patient has never had the drug before. It is extremely useful in the second stage of labour, in uterine inertia, post-partum hæmorrhage and hæmorrhage of the menopause. In post-operative ileus it is useful. We have also used it where the bladder has failed to act before deciding to pass a catheter.

Dr. D. F. Gurd: I am sure we are all exceedingly grateful to Dr. Hall for bringing this interesting subject before us to-night. One question I would like to ask those who have used this drug often: In a case where it has been used and failed to produce delivery, does its effect (causing very strong expulsive contractions) make the use of the forceps any more difficult? The other night I had a case where I hesitated whether I would use pituitrin with the possibility of its not being successful, or the forceps. I decided to use the old familiar forceps. I have not used the drug very often, but where I have I must say it has acted most satisfactorily. These were cases where there was no difficulty except to hasten delivery where it was delayed by long intervals between the pains, ten minutes or so.

Dr. W. E. Enright: I would like to ask Dr. Hall's experience of the effect of pituitrin on the after pains, whether it increases them as has sometimes been thought.

Dr. Grant Campbell: I had a case of a Chinese lady who was having rather a difficult time and as the hours wore on there did not seem to be any progress so I suggested that I might see her and after some difficulty this was allowed. I examined her and found everything right, so gave her pituitrin and in ten minutes the baby was born.

Dr. W. M. Fisk: With regard to pituitrin in the second stage I have used it in a great many cases, always making sure that the way is open, and usually in multipara, but in cases where there is some delay, where the head is partially down in the pelvis and pains pretty strong and still no progress, one can give pituitrin, ½ c.c., and as a rule one will find that in ten minutes the baby is in the world.

Dr. F. A. L. Lockhart: I have used pituitrin fairly frequently in paresis of the bowel, in paresis of the bladder, in cases of shock and in cases of hæmorrhage and I must say that in all those instances

it has certainly been a good faithful servant so I can thoroughly, bear out Dr. Hall's statements. It is not, however, the absolutely innocuous drug one would suppose. In one case of a lady of forty-four, suffering from hæmorrhage at the menopause, a very nervous woman, I had administered ergot on two or three occasions without effect, and rest in bed with hot douches also had no effect. I then gave her 1 c.c. of pituitary extract, next day I gave her another hypodermic, but I had no sooner entered my hospital after this second dose than the telephone rang and the nurse, gasping for breath, told me the patient was dying, finger nails blue, pulse bad and had general collapse. Next day I again visited her and thinking the attack was hysterical gave her another hypodermic and stayed with her to watch if any effect was produced. I kept her interested in some subject of conversation so as to keep her mind off herself and in five minutes the mucous membrane of the lips paled, the finger nails turned blue and there was a general appearance of shock. This served me as a warning that the drug was not so simple as one would imagine. It is, however, very useful but one should be a little bit careful in its administrations. Since then I have adopted Dr. Chipman's plan and administered only ½ c.c. as a an initial dose.

We are very pleased that Dr. Hall consented to give us this paper as such contributions from the general practitioner are what we want more of, and I hope we will hear from him again, as well as from other physicians engaged in general practice.

Dr. Geo. Hall: I wish to thank Dr. Lauterman for his recital of his experience in the diuretic effect of this drug and Dr. Shaw for his experiences. As he pointed out it certainly has done away with the old habit of sitting in the patient's home all night—this is now a thing of the past. I am grateful to Dr. Chipman for his kind remarks, and to Dr. Gurd I would say that after the lapse of a certain time I would be inclined to repeat the ½ c.c. dose, but I see no contraindication why the forceps should not be used in the case he cites. The only case I have come across in the literature of spasm of the os, has been in an early case of the third or fourth month, not at full time. So if one dose of ½ c.c. failed I would wait a little time and give the other half. In regard to the after-pains I have had patients who have complained a great deal of this before they had been given pituitary but after its administration they had not suffered to the same extent. In these cases I have given Burroughs and Wellcome tabloid opium, gr. 1, every fourth hour, three tabloids will control them. Dr. Lapthorn Smith used to follow

this method of administering the tabloid opium, gr. 1, every four hours during the night and visited the patient in the morning about ten o'clock, and if the os was sufficiently dilated, proceeded to carry out the rest of the treatment. I very seldom have a case at night now and I do not think I am doing any harm when I leave three or four tablets to be given as required, and repeated in four hours if necessary. During this time the patient generally is resting and in the morning usually things are ready for me to administer the pituitary extract and terminate the case.

The sixteenth regular meeting of the society was held Friday evening, May 19th, 1916, Dr. F. A. Lockhart, president, in the Chair.

The meeting took the form of a Symposium on Typhoid Fever opened by Dr. H. A. Lafleur on the Diagnosis and Prognosis, followed by Dr. C. F. Martin on the Medical Treatment, and Dr. G. E. Armstrong on the Surgical Treatment.

Discussion: Dr. F. G. Finley, (Lt.-Col. No. 1 Canadian General Hospital, France): In a case presenting the general clinical features of typhoid certain laboratory tests are of the very greatest value. I lay a great deal of stress on the low white cell count often long before the Widal test shows itself. A low cell count is rather rare in other febrile conditions. In the Montreal General Hospital we made a routine of blood cultures from all cases of suspected typhoid and I think we found about 50 per cent. showing the positive results, so that method is certainly of value and particularly in hospital practice.

With regard to the incidence of typhoid and the method of dealing with it in the British Armies in France, a few remarks may be of interest. Typhoid is rare, due to the preventive inoculations. Another feature is the very great care that is taken when a case of suspected typhoid arises among the men. There are a series of laboratories established in France near the trenches where careful laboratory examinations are made to find carriers. These are then immediately isolated when discovered. So to these two preventive measures we attribute, and particularly to inoculation, the very great rarity of typhoid in the present British Armies. Of the typhoid group of cases which occur "A" is classed as the very mild disorder, found chiefly among the Indian troops; it is the form of the disease which occurs largely in the East. The "B" or Belgian type, is really the common one and it is decidedly milder than the

average typhoid in any series of cases. In the early stages these cases show diarrhœa, the lesions being mainly in the large intestine, severe headaches and early enlargement of the spleen, more marked than in the average case of typhoid, readily felt in the first few days. A case of this sort runs an average course of nineteen days but there are a number which run shorter courses and these are apt to be overlooked provided careful laboratory tests are not made. Any case suspected is immediately put in isolation hospital where very careful laboratory tests are carried out, blood, stools and Widal, rapidly made. In para-typhoid, the blood is usually negative owing to the para-typhoids disappearing early and these cases are not usually seen for several days. On the other hand it may be found in the stools. Drier, of Oxford, is using a test which is very satisfactory. It consists of a dead watery solution of Para-B and Para-A and is used in serum 1-10, 1-50 and even 1-500. The tubes are put into a hot water bath at 56° for two hours and complete coagulation is obtained. I consider this test a very satisfactory one. Drier states that the tests are so delicate as to run up to 1-5,000. The men being inoculated there nearly all showed a positive test for the bacillus. In these cases the Widal must be repeated and if it remains constant the condition really is not true typhoid, but if it is typhoid the delicacy of the test comes in. A certain number of men who develop typhoid after inoculation show little or no tendency to agglutination. Mortality is low in para-typhoids and there are occasional complications as occur in true typhoid; hæmorrhage and perforation, in some cases an abscess of the spleen, in one case I saw an abscess of the liver. On the whole the work done in these isolation hospitals is of a high order. Captain G. Shanks has worked at this for a long time and I have no doubt when he returns he will be able to give us some interesting points. I might add that inoculations are now being carried out for the para-typhoid "A" and "B" as well as typhoid, the whole three being given at one time.

Dr. J. Kaufmann: It might be interesting to hear some of the recent advances in vaccine therapy as carried out by Gay, of California, and Chickering, of the Rockefeller Institute, New York. As Dr. Martin has already mentioned, Gay and Claypole have done considerable work along these lines and have very conclusively proved that the injection of the sensitized vaccine given intravenously was a much better method of treating the disease, as well as a much better method of carrying out prophylaxis. The vast majority of investigators to-day practically concur in this. They

have gone one step farther and have attempted to demonstrate, and certainly so far as their paper is concerned conclusively, that if one used a broken-down or a finely-ground organism, taking several strains of typhoid bacilli (really a polyvalent vaccine), ground it very finely, sensitized it and after that removed the endotoxine by treating it with saline and sedimentation, a more specific antibody as well as a hyperleucocytosis would be obtained, which is much more marked with this method of treatment than any of the other vaccines given subcutaneously or intravenously, sensitized or unsensitized. They have given the injections in a large series of animals and have proved that the hyperleucocytosis was not of the same character or of the same intensity as that raised by the injection of this ground vaccine which is sensitized and is polyvalent. They have based their diagnosis of a case on a blood culture which has been positive. Considerably over 50 per cent., 70 per cent. of their cases gave positive typhoid cultures using the bile medium method and 90 per cent. gave the positive Widal carried out macroscopically as already described. The cases they treated were fifty-eight cases of definitely established typhoid individuals, the treatment was carried out in private practice, with few hospital surroundings and little proper nursing. In the first place the dose was from 150 to 300 million bacteria, actually they weighed it, and the standardization was done so that 300 million bacteria were equivalent to 1-10th of a mgm., then the injection was given after the diagnosis was made, intravenously, with the usual results, temperature, chill, vomiting, and sometimes even collapse. They have not had, however, one single death in any of the cases. Among the cases in whom the treatment was carried out, 34 per cent. were little affected, 24·5 were distinctly benefitted and 41·5 were decidedly aborted. This is undoubtedly a step in advance of what has been previously done and certainly more closely approaches a specific method of treatment than anything we have had up to the present.

Dr. W. Grant Stewart: How long is this prophylaxis after vaccination? I had a young girl at Macdonald College who in November was inoculated, and yet in March I treated her for a severe attack of typhoid with a very high temperature, the only difference being that it was sharp and short. I heard of two other cases there also who developed the disease after inoculation.

Dr. Norman Viner: In private practice it is very difficult to arrive at a diagnosis, as in a hospital or institution where laboratory methods may be carried out with such precision as these tests mentioned require. I have found Ehrlich's diazo reaction of much

value and very reliable and I should like to hear it mentioned in this discussion, the general tendency seems to ignore it entirely and I should like to hear an opinion on the subject.

Dr. James Perrigo: In my career I have had a good many cases of typhoid in all classes with all kinds of complications. I have a pretty strong opinion of anti-typhoid treatment and I thought at the time there was not proper discrimination shown in doing this in the recent inoculations for overseas men. Some of the cases I had were officers who were very much run down at the time of the inoculation so I think that in this, like anything else, you should choose your subject and see that he is in proper health at the time of the injections. With regard to complications: I happened to be going through the wards of the Hôtel Dieu and saw two cases of sloughing of the scrotum, in these cases there seems to be a tendency to the formation of bed sores. In my second year in practice I saw another case, only not so pronounced. In these early days we drenched our patients with quinine; then the coal tar products came after and we used them all with the idea of reducing the temperature, and now it has reduced itself to dieting and nursing. I have had three cases of perforation, one died. Three cases were operated on, two of them early recurred, the third died. One complication not mentioned to-night, and a very distressing one, is hiccoughs. They are relieved by bismuth and morphia and once I had to give a hypodermic to give the patient some rest. It is not always a favourable symptom, but it does occur and has to be treated. With reference to the dieting I think one thing should be left out and that is the beef teas, there is nothing like milk and a little cream. I sometimes add barley water. We all remember the time when the dreadful ice packs were given. I never followed this but found the sponging just as good as anything. I have not had any opportunity to follow such a series of cases as related by Dr. Martin. Independently of the large epidemic we had a few years ago, it has been conclusively proved that cases contracted prior to that were contracted outside the city, one seaside resort on the coast of Maine being noted for this; I had four or five cases from that particular place every August, so that one cannot blame the city for all the cases that occur here.

Dr. W. F. Hamilton: I should like to add a word with respect to prognosis. Dr. Lafleur has spoken of toxæmia as a very important prognostic sign. Apart from any complications of the second or third week the pulse rate may be taken as a measure of the severe toxæmia. The pulse rate is a very important matter from a

prognostic standpoint. The frequency with which patients in this period of the disease have "heart attacks"—sudden rapid runs of the heart—are alarming alike to the nurse and the patient, and may be taken as a measure of the toxæmia present, Many cases otherwise going well have thus foreshadowed in them a fatal termination. With regard to the prevention of emaciation in our fever patients I must say I am not so optimistic as Dr. Martin's remarks wou d lead one to think. Some of the charts are exceedingly interesting and convincing. I have on this point charts equally convincing of the difficulty which one has in maintaining nutrition; some patients lose from fourteen to twenty-four pounds in the course of the treatment. In the good cases convalescence began at the end of the third week, followed by rapid gain in weight. Emaciation is very much in proportion to the degree of temperature and many of these patients will not take our high caloric diet. In the treatment of hæmorrhage there is only one drug I use and that is morphia or opium. I have lost faith in calcium chloride. The patients are kept from food for twenty-four or forty-eight hours.

Dr. A. H. Gordon: Some points in connexion with the treatment of hæmorrhage interest me. For some time past at the Montreal General Hospital we have been making use of the suggestion to treat inaccessible hæmorrhage by intravenous injections of hypertonic salt solution. The method has been to inject 5 to 10 c.c. of 5 per cent. salt solution into the vein of an arm. Whether as an effect or a coincidence, in now nearly a dozen cases of pulmonary and intestinal hæmorrhage there has been cessation of bleeding upon the use of this measure.

Dr. H. A. Lafleur. In answer to Dr. Viner's question I purposely did not mention Dr. Ehrlich's reaction because, though at one time I did put some stress on it, we find that there are so many more accurate means of arriving at a conclusion and have put it aside. It is well known that it reacts in other diseases, in some forms of tuberculosis, malaria, and in measles, so that it may be confusing.

Dr. C. F. Martin: Prophylaxis depends largely on the individual's sensibility and while it is a common rule that prophylaxis from typhoid may be for one or two years, in some cases it may be more; then the type of vaccine used makes it hard to give an average of all the results. One cannot say definitely that every case will have an immunity of two or three years, but as a rule one or two years is a fair test.

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GUNSHOT WOUNDS OF THE PRESENT WAR

By E. J. Williams, M.D.

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THE variety of wounds and other surgical conditions presenting at a military hospital are numerous and in many cases of considerable interest. A classification of wounds with regard to the nature of the missile causing such is, in the experience of this hospital, in order of frequency the following: (1) Shrapnel, (2) Shell fragments, (3) Bullets—rifle and machine gun, (4) Hand grenades and bombs, (5) Bayonet, (6) Revolver bullets.

1. Shrapnel Wounds

These were the commonest class of wounds by far presenting for treatment during the first year of the war; the explanation of which is the fact that the present war is what might be termed a "war of big guns", positions being won or lost chiefly by the efficiency of large gun fire on the part of either of the combatants in demolishing the defences and killing or wounding the occupants. The bursting of a well-aimed shell will cause more damage to life and property than many rifle bullets. In bursting over a trench occupied by troops it will kill or wound many men who could never be reached by the direct fire from a rifle.

The missiles being of many different sizes and shapes and travelling at low velocity when coming in contact with the body, produce wounds of different appearances. A sharp piece of steel may cut its way right through the tissues, while on the other hand a large, rough, jagged piece will cause extensive laceration and contusion—besides carrying with it into the deeper parts, pieces of clothing, dirt, etc., and so causing infection, which is a constant

condition in all wounds of this class. When pieces of clothing enter the tissues there is a particularly foul-smelling discharge from the wound simulating that found in B. coli infection and no doubt due to the presence of germs of this group. The discharge is of a reddish brown colour and watery, while the surrounding tissues present a gangrenous appearance. It is in this class of wounds, when not very deep, that excision of the lacerated tissues renders the best results. The pieces of shrapnel, which usually have a low velocity, are generally found lodged in the tissues sometimes just beneath the skin, while others may penetrate to the bone where the resistance is such as to stop further progress. On account of the extensive laceration and contusion of the tissues, also the closing of the muscles over the wounded area, these wounds, when extensive, are very difficult to treat, on account of the difficulty of gaining access to all the infected parts, hence there is a great tendency to the formation of isolated pus pockets unless thorough drainage is established. Hæmatomata are not uncommon in shrapnel wounds.

2. High Explosive Shell Fragments

Although wounds from shrapnel were more frequent during the first year of the war, those of high explosive shells now equal or surpass them. Shrapnel wounds do not manifest such a destructive nature as those from the high explosive shells, where we often find a whole limb or the head completely separated from the body, or where the whole body is blown to pieces. This is the most distressing class of wounds to deal with and contributes largely to the number of fatalities in the field.

Infection is always present and owing to its great extent and the widespread destruction of the tissues and important vessels and nerves, a limb often has to be sacrificed to save life.

On account of the size of the missile and its velocity the destruction of the parts often extends far beyond the visible lacerated and contused tissues, as evidenced by the extensive deep sloughs which are common accompaniments of such wounds, simulating that of a deep electric burn.

3. Bullet Wounds

In the South African war this class of wounds would precede in order that of shrapnel; but the present war differs in many respects from those of previous years—the commoner occurrence of shrapnel, as compared with bullet wounds, being marked.

To-day we are dealing with large bodies of troops drawn up in opposing positions over short distances and both being well "dug in" and protected from direct rifle fire by substantial parapets and trenches which can only be reached by the indirect fire of artillery, hand grenades, and bombs, or a charge on the part of one side or the other. It is in these charges that most bullet wounds are inflicted and the majority of these by the rapid-firing machine guns. "Sniping" is a practice which contributes many casualties to this class. The difference in size, shape, weight and velocity of the bullets used by the different nations in this war does not influence to any extent the nature of the wounds inflicted. The explosive effect is one of the most important factors for consideration, this depending chiefly on the velocity at the time of impact and the density of the tissue involved.

As pointed out by Stevenson in "Wounds in War", the explosive effect which is manifest in the widespread destruction of tissues depends on the transmission of energy from the bullet to solid tissues (bone), hollow organs filled with fluid (stomach, intestines, etc.), very vascular tissues, etc., through which it is transmitted to cellular tissue where the destructive effects are manifest. On account of the frequency of sniping and infantry actions at close ranges a large number of wounds exhibiting the destructive effects of explosive action of bullets have occurred. This is a class of wounds which, owing to the extensive attrition of the tissues, calls for the most careful attention on the part of the surgeon.

The entrance wound, if in the soft parts, may be smaller than the calibre of the bullet, while if situated in firm tissue or where bone is only slightly covered by tissue it is large and irregular. A bullet of high velocity when striking bony structures will often cause extensive undermining of the tissues, but if its course is more superficial a breaking through the tissues from within produces great destruction of overlying structures. Fragments of bone are often carried to a considerable depth along the track of the bullet and may cause serious complications by tearing through large blood vessels, nerves, etc. In the case of a low velocity bullet the wound of entrance is often much larger than the bullet, depending chiefly on the position of the bullet at the time of impact. On account of the centre of gravity of the pointed bullets being situated well back toward the base there is a tendency towards rotation as the velocity diminishes and they may strike the body in a lateral or oblique position and so cause a large wound; or again they

may penetrate the part point end first and then rotate as they pass through the tissues and will often be found with the point directed towards the entrance wound.

In cases where the wound of entrance is situated at a point far removed from the area of lodgement of the bullet, which is found pointing in the direction of the entrance wound, it appears to me that the reversed position is often due to the bullet striking a bone or other hard substance at the termination of its course and being turned about. In one of my cases the entrance wound was situated one and a half inches above and an inch to the left of the sacral prominence and the bullet was found in close proximity to the spine of the left scapula, pointing in the direction of the entrance wound. The tissues between these points, in the course of the bullet, were apparently very slightly damaged as no untoward symptoms developed in this area, which would not likely have been the case if the bullet had made even a half turn in its course.

In the case of a ricochet bullet the cupro-nickel or nickel jacket which surrounds the lead is sometimes torn loose from the lead core, and, entering the body, may cause serious injury by cutting with its sharp, ragged edges, important blood vessels and nerves. On account of their irregular shape these are very often difficult to extract, especially if deeply imbedded. In one case which came under my care the complete jacket, torn up one side, struck the right side of the face at the junction of the ala nasi with the lip and passed through to the left antrum of Highmore, firmly imbedding itself in the posterior wall. It was necessary to make a large opening into the antrum before the missile could be extracted.

Pieces of clothing, foreign matter, etc., are seldom found in uncomplicated bullet wounds, so that the majority of these are treated conservatively in contra-distinction to shrapnel wounds which are practically always septic and treated accordingly. The reversed bullet, i.e., the bullet removed from the shell and replaced point inwards, causes wounds similar to a dum-dum. These were used quite extensively in the early part of the war where the trenches of the combatants were separated by a distance of less than a hundred yards and when rifle fire from the trenches was a commoner practice than at present, and within which distance the velocity maintained was sufficient to cause them to strike the part with base-end foremost, or partially turned. The resulting wound simulated in every particular that produced by a dum-dum bullet. Large numbers of these reversed bullets were found on the German prisoners captured at different times.

4. Hand Grenades and Bombs

These are of many types from the home-made jam-tin bomb to the finely-constructed mechanical device with a well-regulated time fuse or percussion contrivance. The wounds, as a rule, are much less severe than those of shells on account of the limited amount of explosive and the small size of the missiles used. However, in close action very extensive injuries have resulted when a bomb has been dropped in an occupied trench. A great variety of missiles are used in the bombs, such as nails, screws, wire, pieces of broken steel and iron, gramophone needles, etc. These, as a rule, do not penetrate very deeply and so do not cause such extensive or dangerous wounds as do shrapnel or high explosive shells. Infection is the rule in this class of wounds.

5. Bayonet Wounds

Bayonet wounds are extremely rare and are as a rule fairly aseptic. Practically all such wounds treated were accidental.

6. Revolver Bullet Wounds

These are so rare that little consideration may be given them. At close range the bullet causes extensive laceration and bruising of tissues similar to dum-dum bullets and consequently infection is common.

Treatment—Infected Wounds

The keynote for successful treatment is "drainage" and then free lavage to clear away infective organisms, and also the stimulation of the flow of serum into the affected area. Free deep incisions with counter openings in deep seated infections must be practised in all these cases. Drainage tube tracks must be of ample size to admit the tube with ease, otherwise they act in the manner of an obstructive rather than drainage agent. Perforated split rubber tubing, gutta percha tissue, or strips of rubber dam are most commonly employed; gauze very rarely unless surrounded by rubber tissue and kept continually moist. The practice of swabbing the wound with carbolic acid followed by alcohol was discontinued after a very brief experience on the part of a few of the medical officers, and supplanted by the saline submersion, irrigation, or moist dressing method. Although normal saline solution seemed to render excellent results, the solution of Wright cleared the wounds up more promptly.

Previous to carrying out the saline treatment every effort is made to remove all infective material with the use of dissecting forceps, light scrubbing with swabs, or the excision of gangrenous tags of skin and superficial tissue. The parts are then thoroughly bathed with hydrogen peroxide solution.

During the past few months we have been using as a stimulating antiseptic, Dakin's Fluid, which is composed of the following:

Bleaching powder	$12\frac{1}{2}$ grammes
Acid Boric	$12\frac{1}{2}$ "
Water	1 pint

This is allowed to stand for one hour after mixing and the supernatant fluid is used. The results obtained in the treatment of infected wounds with this solution have been remarkably good.

Special attention is devoted to securing for the wounded part absolute rest insofar as this is possible, hence many contrivances have been instituted for supporting comfortably and efficiently the wounded part during the carrying out of dressings or other measures necessitating movement.

Gas gangrene, if of superficial extent, is treated by multiple free incisions, followed by a dressing of gauze which is kept continually soaked with hydrogen peroxide. If the infection is deep and extensive in the case of limbs, amputation is performed, either by the "no flap" circular method, or by the flap method leaving the flaps unsutured. These are turned back at each dressing, the parts thoroughly cleansed, a few Wright's tablets placed over the wound surface and then the flaps replaced. The injection of peroxide of hydrogen into the tissues has not rendered particularly good results in the cases of gas gangrene in which we have used this method.

Tetanus which was fairly common in the early part of the war has now become rare thanks to the prophylactic doses of antitetanus serum which is now used at all advanced dressing stations.

INTERNAL SECRETIONS

By J. Bertram Collip, M.A., Ph.D.

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THE reciprocity of activity between different parts of the animal body and the concomitant interrelationship of function has been well called the "*consensus partium*". It is within comparatively recent years that the manner in which the individual organs react upon one another and the mechanism by which their interbalance is maintained has been elucidated. The central nervous system, affecting and controlling as it does the correlation of the various physiological activities, supplies an excellent example of such a mechanism. By its means the coördinated activities of the different parts of the body are regulated and controlled, and it is little wonder, in view of the manifold characteristics of this controlling station, that scientists, until very recently, considered it the sole mediating agent between the many different parts.

From the time of the ancients a humoral relationship between the various organs has been given credence to and indeed this idea is older than that of the neural relationship of organs.

Soon after experimental physiology had found a sure footing it was seen that the course of normal development and growth might be materially modified by artificially modifying the chemical constitution of the fluids surrounding the organism. It was also noted that changes both qualitative and quantitative in the metabolic processes of some parts of the body did likewise. It was, therefore, clearly demonstrated that to the nervous regulating mechanism a chemical regulation must be added.

A great deal of the so-called automatic irritation of the nervous system is really brought about by the agency of the products of cell metabolism. Thus, in suffocation, the changes in respiratory and cardiac activity, the spasms of the voluntary muscles, and the tonic contractions of the muscular tissues of the blood vessels are

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due solely to over-irritation by the products of metabolism, an excessive quantity of which are circulating in the blood. The regulation of normal respiration is moreover due to the agency of chemical stimuli, of which the hydrogen ion concentration in the blood is the all important one. This latter is directly dependent on the carbon dioxide tension in the blood. In muscular work this goes up and at once the respiratory centre is aroused to greater efforts by a direct chemical stimulus. The fluctuations in respiration are therefore due to the varying amounts of carbon dioxide in the blood and they are entirely suited to the momentary needs of the organism.

By the term "metabolism" we give expression to all those changes which may occur in the manifestation of life. If the living organism is in a normal state it follows that the metabolism must be normal. This implies that there must exist a state of complete harmony between all the factors which make for a healthy, well-nourished individual. These factors have aptly been termed by Professor Noel Paton, "the regulators of metabolism." These regulators are of two types. In the first class we have the nervous system; in the second, definite chemical regulators. This latter class embraces the internal secretions of the so-called ductless glands and it is of these that I wish to speak more particularly in the few moments that are here allotted to me.

The first demonstration by means of experiment of the nature of the activity of a true ductless gland was due to Berthold, 1849. He showed the influence which an organ, through which the blood stream circulates, can exert upon the composition of the blood and hence upon the entire organism. The testicle was removed from a cock and grafted upon another part of the body, with the result that the bird remained "male" in regard to voice, reproductive instinct, fighting spirit, and the growth of comb and wattles.

Theoretically it is possible for each organ, each tissue and perhaps even each cell, acting through the agency of the blood stream to exert a definite influence upon other parts of the body.

Brown Séquard stated that all glands with or without ducts supply the blood with substances which are either useful or essential, the lack of which produces pathological signs. This generalization, however, would hardly hold true to-day.

Bayliss and Starling proposed that the name "hormone", meaning "to awake or excite", should be applied to those physiological substances which act as chemical stimuli and serve as intermediaries between different parts of the body.

Investigation has also shown that there is a considerable group of interactivities which are aroused in the body for purposes of offence and defence by the provoking causes of disease and by various poisons. This involves the production of numerous antibodies, etc., and this production is undoubtedly due to the chemical activity of various cells. The antibodies are then in the strictest sense of the term, internal secretions. But to confine ourselves to the chemical regulators of normal metabolism, in other words to the "hormones", our first inquiry should be as to the nature of these substances. They are specific chemical compounds produced by the activity of definite organs. They are for the most part of small molecular size and very stable. They produce their specific effect in infinitesimally small quantities, and they cannot act as antigens, which is to say, they do not cause the production of antibodies if they be injected into individuals other than those from whom they have been derived. True hormones have been classified according to the manner in which they act. Thus we have the formative and protective, growth-promoting and growth-retarding, stimulatory and inhibitory types.

The term "ductless gland" as applied to the source of origin of an hormone is in a way misleading. By gland we understand in the morphological sense a secreting epithelial structure which may or may not be provided with a duct. Now, since many of the internal secretions so-called, have their source in organs of a non-epithelial nature, it is at once apparent that the term "ductless gland" if it is to be retained is to be applied to a series of organs which have in common a similar physiological function to perform, though differing very widely in anatomical structure. Function then, and not structure, brings a varying group of organs together for common consideration.

Knowledge concerning these most important organs has been obtained in various ways. The experimental method of removing an organ and noting the effects produced thereby has yielded much valuable information as has also the method of grafting. But here, and perhaps more so than in any other field of physiology, has the clinical method been of inestimable value. Comparative anatomy and histology have also been of service in making clear the proper significance of these organs.

While an enormous amount of study has been given to the "ductless gland" in the last few years (indeed the papers on this one subject now number upward of three thousand) and a great deal of positive knowledge has been gained, there yet remain many

hazy points in regard to their mode of activity. Many theories have been put forward, which are of a very conflicting nature, by the different workers. But theory has always been in the advance guard and so we may expect it ever to be. The essential point is that from among the mass of evidence which has been put forward, many important facts are outstanding which are of the greatest value to practical medicine.

The structures which should be considered in a discussion of internal secretions are as follows, the suprarenal glands, the pituitary body, the pancreas, the reproductive glands, the thymus gland, the mucosa of the small intestine as well as that of the pyloric region of the stomach, the pineal body and the thyroid system.

The suprarenal bodies, as is also the case with other organs of internal secretion, have more than one function to perform. The medullary substance differs widely from the cortex, both in function, structure and origin. The medulla of the suprarenal is the seat of manufacture of the well-known chemical substance, epinephrine or adrenaline. The point of action of this chemical is the end-organ of the terminals of the sympathetic nervous system and is all-important in maintaining the tone of that system. The physiology of the suprarenal cortex is not so clearly understood as that of its medulla. It may have something to do with pigmentation as Addison's disease would seem to indicate. Some observers hold that the cortex regulates the nutrition of the reproductive glands. We have proof, however, that it is essential to life, as experiments on Elasmobranch fishes have shown.

The pituitary gland is composed of three distinct parts, a pars anterior, a pars intermedia, and a pars posterior. Each of these again, it is probable, has a distinct function to perform. The posterior lobe produces a chemical substance, pituitrin, which has found such great service in practice on account of its specific action on the uterine muscular wall. It also is a galactogogue, as has been shown by MacKenzie. The anterior lobe produces a substance of unknown nature which seems to regulate growth of bone. The work of Horsley and Cushing has done much to unfold the secrets of the pituitary body. Hyper-activity of the anterior lobe as is supposed to be frequently the condition in cases of tumour, leads to acromegaly or gigantism. Hypo-activity, on the other hand, may be the underlying cause of certain cases of obesity. There is also a certain relationship between the pituitary and the reproductive glands. The pars intermedia is believed by some to be closely associated with the thyroid gland.

The pancreas as an organ of internal secretion has been in much dispute. The peculiar islets of Langerhans, which are situated in the pancreas, have received various interpretations. That some close relationship between the pancreas and carbohydrate metabolism exists has long been suspected, but the complete failure in all attempts of organ therapy in diabetes mellitus did much to discredit this theory. Very recent work by Cohnheim and Levene has demonstrated the use of the internal secretion of the pancreas in the normal destruction of dextrose within the organism. Unfortunately, when the process becomes disordered pancreas feeding cannot correct the defect.

In dealing with the reproductive glands we must again clearly differentiate between the production of the sexual elements by these glands and the additional important activity, their hormone-elaborating capacity. The function of the hormones manufactured by the gonads has been quite clearly demonstrated. The internal secretion of the gonad becomes effective early in embryonic life and it is to the activity of this substance that the primary sexual characteristics are due. For example, it is impossible to have what might be called a neutral as regards sex. A male castrated early in life becomes quite different as far as sexual characteristics are concerned from a normal male, but yet does not approach in resemblance to a female also castrated at an early age. The hormones which regulate the sexual characters are formed in the case of the male gonad by the interstitial cells of Leydig, while in the female gonad the stroma ovarii are believed to be the seat of their elaboration.

After puberty secondary sexual characteristics make their appearance and they also are due to the activity of the internal secreting mechanism of the gonad. The activity of the female breast, one of the secondary features of sex, is due, it is thought, to the ovarian activity and also growth of the uterus. Ovulation, menstruation and the œstrus cycle are again all due to the periodic activity of this organ.

The corpus luteum which develops and attains a considerable size within the ovary, if ovulation has been followed by impregnation and fixation to the uterine wall, also assumes the part of a specific hormone producer. The maintenance of the embryo and later of the fœtus on the wall of the uterus is due to the functioning of the corpus luteum.

The swelling of the breasts and their preparation for lactation is probably due to a hormone produced by the fœtus itself, although the causation of this has also been ascribed to the corpus luteum.

The prostate of the male is believed to be an hormone producer. Removal of the prostate according to Biell leads to lessened spermatogenesis.

The thymus gland is closely related to the gonads. It functions until the age of puberty is reached at which time it involutes. While it is active the onset of puberty is impossible. It thus acts in holding the complete development of the reproductive glands in check until growth has become well advanced. During the period of its activity growth can take place very rapidly due to the retention of the calcium salts within the body, a process which it is held is facilitated by this organ.

The mucosa of the small intestine is also a seat of elaboration of a specific hormone. The substance secretin, which it manufactures and sets free only under the stimulus given periodically by the acid chyme poured out from the stomach, is the activator of the pancreas. Thus it is only when food has actually been taken that the pancreas is called upon to secrete the digestive enzymes.

The mucosa of the pyloric region of the stomach under the influence of the first end products of gastric digestion also liberates a specific chemical substance known as gastrin which passes by the blood stream to the glands of the fundus region and acts as an accessory stimulus to their activity.

As regards the pineal body it is doubtful whether it should be looked upon as a ductless gland. In times past various functions have been ascribed to this structure. It was said, for instance, by Descartes to be the seat of the soul. In cases of tumour of the pineal body of children the genitals have been noted to have been much overdeveloped.

The thyroid apparatus embracing the thyroid gland and the two pairs of para-thyroid bodies, is one of the most interesting as well as important of all the ductless glands. That the thyroid is a powerful agent in regulating metabolism was discovered in the middle of the last century by Schiff. The function of the whole system seems to be that of maintaining the balance of neuro-muscular activity. The part played by the para-thyroids is, it is thought, widely different from that performed by the large single gland itself. This is demonstrated by the fact that removal of the thryoid alone leads to a different train of symptoms than the removal of the whole apparatus. The converse is also true. Likewise a diseased condition of one or other of the parts of this system leads to the manifestation of different pathological signs.

Without going into any detail, the various conditions in which

the thyroid system is known to be involved are as follows:—cretinism, myxœdema, Graves' disease, various types of goitre, paralysis agitans, certain forms of tetany and possibly eclampsia.

Hypo-activity of the thyroid itself is said to be the cause of myxœdema and cretinism and here it is very significant that thyroid medication is of great value in such cases.

Hyper-activity is the condition in exophthalmic goitre, while in certain other types of goitre a lessened activity of the gland is supposed to exist.

Removal of the para-thyroids leads to tetany. It is believed by some that the function of this structure is to destroy certain toxic materials which are present in the circulation. If these are not detoxicated, tetany follows.

I have now endeavoured to give as briefly as possible what physiologists to-day hold to be the functions of the chief ductless glands. A brief resumé such as this might lead one to suppose that each of these organs possesses some type of activity peculiar entirely to itself. Now, while this is the condition in the case of many of the endocrine glands, we must not overlook the fact that there is an interrelationship between these organs and even an overlapping in some instances of function. For example, carbohydrate metabolism is influenced not only by the pancreas but also by the thyroid and the suprarenals, while growth is affected by the gonads, the pituitary, and the thyroid bodies.

The forty-second annual meeting of the Toronto Hospital for Incurables took place on October 27th. In his report, the medical superintendent, Dr. Edmund E. King, stated that 222 patients were at present in the home and treatment had been given to 329 during the year. Seventy-two deaths had occurred, including that of one patient who had been in the institution for thirty years and of another who had been there for seventeen years. The president, Mr. Ambrose Kent, referred to the need for more accommodation for patients suffering from cancer and expressed the hope that a new wing might be built which would furnish roo n for thirty patients.

APPENDICITIS

By Max O. Klotz, M.B.

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IN 1582 Ambrose Paré said that he had striven so successfully for forty years to bring surgery to a stage of perfection, that there was little left for posterity, except to add minor details which suggest themselves, to things already discovered. As late as 1882 S. D. Gross, first president of the American Surgical Association, stated "that if operative surgery has not reached its finality, it is as nearly perfect as we can hope to make it," and he had never removed an appendix.

It is not quite thirty years since Fitz first informed us of the conditions peculiar to the right iliac fossa, and since his day tons and tons of literature have been written about appendicitis, so that it seems almost presumptuous on my part to offer any more on a subject which has already been so voluminously covered on all sides.

It is almost superfluous to say that appendicitis is accepted to-day, not only by the profession but by the laity as well, as a purely surgical disorder, and while it would be, perhaps, not proper to say that cases do not recover without operation, or even that an operation is advisable in every case, it is desirable, however, to impress once more on the profession and the laity that every case of acute appendicitis should be looked upon as an acute surgical emergency and that steps should be taken at once to provide for the immediate coöperation of a surgeon.

It is just here that it is of the utmost importance that a happy understanding should be reached between physician and surgeon, as in this disease, almost more than in any other, it is frequently the case that "he who hesitates is lost".

Pathology. A clear understanding of the pathology of acute appendicitis will help much in advocating its rational treatment. For purposes of classification they are commonly grouped under the following headings: (*a*) catarrhal; (*b*) ulcerative; (*c*) purulent;

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(*d*) gangrenous. The lesser grades of the inflammatory process readily give place to the more severe forms. The catarrhal type of the disease we need hardly discuss because it is unusual to have patients with this condition referred to the surgeon. Undoubtedly, the catarrhal processes are but transient and accompany similar conditions of the bowel as the result of indiscretions in diet. In the remaining types of appendicitis we are dealing with an inflammatory process of such proportions that surgical intervention is necessary for the most rapid and safest measure to cure.

It is probable that the severe forms of appendicitis all have their beginning in an ulcerative process. In this, the appendix may be compared to the tonsil. In each of these structures lymphoid tissue is a prominent component of the organ and between the lymph follicles there are deep crypts whose shape and size vary much in different individuals. These crypts are prone to lodge foreign materials and bacteria. Where the crypts are wide the peristalsis readily evacuates the contents, but where the crypts are narrow or bottle-shaped, foreign materials are apt to accumulate and bacterial fermentation irritates the neighbouring tissues. Destruction of the surface epithelium is followed by superficial invasion of bacteria with development of ulcer. Such ulcers may be very shallow or at times the erosion is deep. These ulcers may be demonstrated in every case of early appendicitis. If the ulcer is localized, the wall of the appendix is not damaged to any great extent. On the other hand, the bacteria may migrate from the area of ulceration and lead to an extensive purulent infiltration of the wall. These two types, the ulcerative and purulent, are the most common met with in cases of appendicitis operated upon early.

A point worthy of note is that these acute lesions have their beginnings on the inner surface of the mucosa of the appendix. Appendicitis is not a metastatic focus of infection, but it is one which begins in an inflammatory process of the mucosa. The bacteria attacking the bowel wall are obtained from its contents.

The gangrenous appendicitis is, in the majority of instances, a sequel to the ulcerative type. Following the localized inflammatory process with ulcer, the bacteria tend to invade the wall along the routes of least resistance. Thus they migrate along the lymphatic channels which follow the periphery of the blood vessels. An inflammatory process is induced in the walls of the fine arterioles and veins followed by thrombosis. These thrombi continue to extend through the vascular tree of the appendix and into some of

the larger vessels of supply. With the occlusion of these vessels, the nutrition to a local area or even to the distal portion of the appendix is completely cut off without an opportunity of reëstablishing a flow by anastomosis to the affected part. Gangrene then supervenes with its wholesale destruction of the appendix wall. In short, gangrenous appendicitis is not directly the result of bacterial action but results indirectly through progressive thrombosis in an area of ulceration. The rapidity with which the involved tissues undergo necrosis is remarkable. Such necrosis or gangrene leaves no opportunity for the tissue to respond, but permits the leakage of bacteria through the entire necrotic wall with the great danger of peritonitis.

Perforation of the appendix may be the result of a progressive erosion in a localized ulcer or may be the outcome of a focal area of gangrene rapidly induced. In the former, which is accompanied by an inflammatory reaction, an exudate over the serosa attempts to wall off the outer surface of the injured tissue. Adhesions may form and prevent disastrous results after the wall has been perforated. If, however, gangrene is induced through nutritional disturbance, the rapidity of the necrosis of the involved tissue may give no opportunity for the tissues to protect themselves by exudate or adhesions.

In recent years some authors have claimed that appendicitis is the outcome of a blood distribution of bacteria gaining entrance to the body tissues at some distance from the appendix. The tonsil has been spoken of as the portal of entry. A study of human appendicitis can give no support to this theory. It is rare to find a metastatic abscess of the appendix and the character of this lesion is vastly different from clinical appendicitis.

Diagnosis. While it is impossible in a paper such as this, which of necessity must be brief, to go over the entire subject from the question of the origin of the appendix down to the last word in treatment, I would like to lay stress particularly on two points, namely; first, the necessity for early diagnosis, and, secondly, the equal necessity for early operation. Doubtless a great many mistakes in respect to diagnosis are constantly being made and will continue to be made, but let us hope that with increased attention to the symptomatology, weighing each symptom in turn and trying to give it its proper value, we shall become less liable to error and at times save our patients needless operations.

To amplify this point in respect to diagnosis permit me to quote a few cases from my own practice, which will go to show how easy it is to fall into error.

Case 1. Boy, aged seven years, sent in from the country with a note from attending physician, stating that patient had acute perforated appendix and asking for immediate operation. On examination I found the child to have a temperature of 104·1°, rapid and shallow respirations (forty), pain in the right side, extending from the mid-axillary line to the right iliac region; pain on respiration and occasional slight hack. Closer examination convinced me that this was nothing more than a simple lobar pneumonia, confined to the right lower lobe of the lung. Palpation of the abdomen showed a more or less general rigidity, due to abdominal breathing, but no tenderness on pressure anywhere. Operation, of course, was not done and in another forty-eight hours signs of a full blown pneumonia were present, from which, I am glad to say, the child made an uninterrupted recovery.

Case 2.—A child of twelve was referred to me for operation, who upon examination was found to have a temperature of 102° with pain in right iliac region and also in the right hip joint, the leg being flexed on the thigh and movement being exceedingly painful. Closer examination showed no tenderness on pressure over the appendix and there was a total absence of a history of acute onset of pain in that region. There was no vomiting, in fact, no gastro-intestinal symptoms. Previous history showed that the child had been suffering from acute inflammatory rheumatism and the present attack was an acute rheumatic arthritis of the right hip. No operation. Subsequently the child had other joints involved and was laid up for several months before making a recovery.

Case 3.—Young woman of twenty-two, seized with acute pain in the right lower pelvis at night, some vomiting and general abdominal distress. She was referred to me for operation and on examining her I found that she had no temperature, no increased pulse rate, but was menstruating at the time. Considerable tenderness existed over the area of the appendix and over the pelvis on the right side, and although my better judgement compelled me to believe that I had not to deal with an appendix condition, I operated here and found nothing more than a ruptured Graafian follicle, with some slight hæmorrhage into the pelvis. Appendix and other organs were absolutely normal. Appendix was removed, of course, and needless to say patient made an uninterrupted recovery, but here I was quite satisfied I had subjected my patient to an unnecessary operation.

Case 4.—A young woman of twenty-seven, married, and six

months pregnant for first time, referred to me for operation for acute appendicitis by one of my colleagues; giving a history of having had soreness in the right side with occasional acute exacerbations, covering a period of three or four weeks. The temperature had been irregular, the highest point reached having been 100°, pulse rate but slightly accelerated, general malaise, loss of appetite, constipation and occasional nausea. On examination I found her pulse rate practically normal, temperature of 99·2°, no tenderness over the appendix, but tenderness on deep pressure over the right kidney. Examination of the urine showed pus cells in abundance with some blood cells in acid urine. Catheterizing of the ureters showed pyelitis on the right side, the left being normal. Appropriate treatment with irrigation of the pelvis of the kidney cleared the condition up promptly, and she went on to full term pregnancy without further difficulty.

I might go on and cite still further cases of gall-stone colic, renal colic, crises due to movable kidney or those associated with locomotor ataxia, early typhoid, pus tubes, perforated duodenal or gastric ulcers, extra-uterine pregnancy, mistaken for appendicitis, but I have mentioned just these few cases to show how simple it is to fall into error and yet how, with a little care, we may prevent unnecessary operation.

Generally speaking, however, if we have a symptom complex of sudden onset of pain in the right lower abdomen with increased pulse rate and a rise of temperature, and if in addition we find an increased white cell count with, or possibly even without, vomiting, with more or less general abdominal tenderness and splinting of the muscles over the area of the appendix, we may be reasonably safe in assuming that our patient is suffering from an acute inflammation of the appendix and it may be well, perhaps, to remember here, that refinements in diagnosis in respect to the type of appendicitis should not be made before operation, but rather after, because it is only waste of time in acute conditions of this description, and a mistake in classifying the particular variety might lead to disastrous delay. Whether the inflammation of the appendix is of a catarrhal, perforative or gangrenous type, is a matter which can be settled much more easily with the appendix outside of the abdomen than in it.

Unfortunately, when called upon to see an acute case for the first time, within a few hours after its onset, we have no means of foretelling what will be the eventual course it may pursue. It is only a haphazard guess at best to try to draw any conclusions as to

whether resolution will take place or whether perforation with its attendant dangers is likely to occur. Hence it seems obvious, to anyone who has seen any large number of operative cases, that the earliest possible surgical interference removes all possible doubt as to the outcome.

Mortality. The mortality in cases operated upon within the first twenty-four hours is so low as to be an almost negligible quantity. Turner,[1] in referring to a large series of cases (3,951), operated upon in the Royal Infirmary at Newcastle-on-Tyne, gave a mortality of 2·6 per cent. in cases operated upon before general infection had occurred, and a total mortality of 5·1 per cent. Many operators give statistics of one hundred consecutive cases operated on within the first twenty-four hours, without a death, and I may add that my own records bear this out. DeQuervain's[2] results in over five thousand cases operated upon, in respect to mortality, were as follows: On the first day he had a mortality of ·690 per cent., after the second day 5·7 per cent., after the third day, about 10 per cent. and after the fourth day 21·2 per cent. It might be added here that of his cases operated on on the first day, mistaken diagnoses occurred in only 1·4 per cent. of his cases.

Kocher[3] reports two hundred and ninety-nine consecutive acute cases, not perforated, operated upon the first and second days, with no mortality. One should look on every case of acute appendicitis as a hæmorrhagic inflammation, including danger of necrosis of mucous membrane and wall. Remembering this, every case must be considered as one in which danger to life is imminent from the outset, and hence the necessity for the earliest possible operation.

The early operation as well argues against the occurrence of post-operative complications. As the statistics of deQuervain, just quoted, also show, complications occurred in only 7 per cent. of the cases operated upon on the first day, and in 20 per cent. of the cases operated upon on the second day, and from his series he has drawn the conclusion that of the four hundred cases of appendicitis that die annually in Switzerland, three hundred and sixty could be saved by operation on the first day. One may properly say here, that when a death occurs in a case of appendicitis, this fact in itself is prima facie evidence of a blunder on someone's part, and the same may be said of the finding of pus in the pelvis at the time of operation. This does not necessarily reflect on the surgeon or physician, but may be due to the officious interference of some member of the family of the patient, or possibly due to objections on the part of the patient himself to be operated upon until,

unfortunately, the more favourable time for operative interference has passed.

Fortunately it is our experience, as the years go on, that the general practitioner is realizing the urgency of acute appendicitis much more forcibly than he did even ten years ago, and even the lay public, recognizing this, asks almost at once, after a diagnosis of appendicitis has been made, "how soon will the patient have to go to the hospital?"

Cases of appendicitis from the surgical point of view may be grouped as acute, interval cases, chronic cases and incidental or chronic cases found in the course of operation for some other disease.

Treatment. The treatment of appendix conditions naturally varies according as we have an acute inflammatory appendix, with or without perforation and abscess, or a chronic condition, to deal with.

Now as to the time of operation in acute cases. This formerly was a very vexed question and I can recall twenty years ago listening with rapt attention to the profound discussions in the medical world as to what was the best time to operate. It is generally accepted now and I think the experience of all who have seen a large number of cases, that the time to operate is *at once*, and as Murphy says, in all conditions of acute abdomen, "Get in just as quickly as you can and get out just a little quicker."

The operative procedures themselves should be preceded by a definite line of treatment while the patient is still in the hands of the physician, and this differs considerably from the rationale followed only a few years ago. At that time it was generally customary to give an active purge promptly, calomel preferred, with salines following, morphine if the pain was very great and permission to the patient to take fluids. Experience has proven that the best results are obtained by withholding all fluids from the stomach, using lavage if there is any vomiting, and applying ice locally; in short, to limit peristalsis and reduce it to a minimum. It is only in the rarest cases that morphine may be required.

It is desirable occasionally to give an injection of one sixth or one fourth of a grain of morphine before a patient is removed to the hospital. I have made it a practice for some years past to give one fourth of a grain for adults, and correspondingly less for children, half an hour before the anæsthetic, as we have found that it takes less of the anæsthetic and there is less nausea, less pain subsequently, and less post-operative shock after its use. No purgatives are given whatever, and the skin locally is prepared as for ordinary abdominal

operations by the usual iodine method. It is immaterial whether one uses benzine, gasoline, or turpentine, provided the skin is thoroughly cleansed with soap and water and then painted with ordinary tincture of iodine. Personally I use the incision through the right rectus muscle almost entirely, as experience has proven that hernias are almost unknown by the use of this incision, which at the same time gives freer access to the pelvis, particularly in women, where one is apt to meet with other complications, and by being extended upwards if necessary, permits of the examination and treatment of other conditions should such be present.

Where the appendix has not yet perforated, it is as a rule readily found, particularly by following down the anterior bend over the cæcum, and removed after tying off, by means of the cautery.

For long years the treatment of the stump was a vexed question, but any means which will cover it with peritoneum and prevent the development of adhesions between it and surrounding organs will answer the purpose. In my own practice I pick up with a straight needle, threaded with silk, four points of the surrounding peritoneum either in the cæcal wall or in the ileo-cæcal fossa, and drawing these together by making traction on the two loose ends of the silk, make, in effect, a purse string suture which completely covers in the stump, and I have never had the slightest trouble afterwards. The neatest stump is obtained, probably, by cutting the appendix off flush with the cæcum and suturing the wound in the usual intestinal way, but this method takes more time and may invite infection. The wound is then, of course, completely closed up by a suture of the peritoneum, a suture of the sheath of the rectus, in fat subjects an additional row of interrupted cat-gut sutures, and finally the application of Michel's skin-clips, which are now almost universally used and commend themselves for their ease of application and corresponding ease of removal, and leave a cicatrix which in its æsthetic values, is much to be preferred to that following the use of silk-worm gut sutures, where coaptation of the skin margins is rarely as accurate as is the case when the clips are used.

Following the application of the clips the wound is painted with iodine and in many cases no dressing applied whatever, beyond an abdominal binder, the main object of which is to keep the patient's hands from fingering the wound. A very small pad of gauze may be laid over the clips and seems to add to the patient's comfort, but there is practically never occasion to use the huge pads of wool and gauze, which for so many years have been the accepted form of dressing by most conservative surgeons.

In all operations where we find the appendix perforated, with or without the presence of an abscess, and with or without the presence of limiting adhesions which may not have developed until after the third day, the appendix is removed as described, but here necessity will be found for the use of a drainage tube.

I may say here, that in practically all cases of abscess, with perhaps a single exception, the incision goes through the right rectus muscle. The exception is the presence of a retro-cæcal abscess which seems to point to the right. In these cases an incision close to the anterior superior spine permits of ready access, and frequently allows drainage extra-peritoneally, that is to say, the peritoneum may be peeled off the parietal wall and the abscess opened from its posterior surface, thus avoiding the opening of the general peritoneal cavity, but has the objection, however, of making the removal of the appendix frequently a very difficult matter and for this reason is rarely employed.

Where there is little or no pus present a cigarette drain may be all that is required, but personally I rarely use the latter, as its capacity for drainage is very limited, the gauze wick being saturated in a few hours, after which there is no further drainage. Consequently I much prefer the use of a stiff rubber tube, through which, after the removal of the appendix, any pus, either in the abscess cavity or the pelvis, may be aspirated and into which, before the patient is finally removed from the operating table, a gauze wick may be inserted to be removed at from four to six hour intervals, depending upon the amount of pus present, and through which collections of pus may be aspirated during the course of convalescence.

It is desirable in practically all cases in which abscess is present to remove the appendix at the same time, although issue has been taken in respect to this course by very eminent surgeons. Arx[4] and Van Buren Knott[5] both quote a large series of cases in which they have removed the appendix in all abscess cases and with most satisfactory results. Doubtless cases arise in which there is great difficulty in doing the radical operation, but the more experienced one becomes the fewer cases present themselves where the removal of the appendix will prove to be impossible. Its complete removal and the breaking down of all pus pockets in and about the cæcum, converting the area into one single large abscess cavity, facilitates drainage and shortens the period of convalescence, and furthermore at once relieves the patient of a secondary operation and doubtless removes the possibility of later complications.

Moore,[6] in discussing a radical operation in case of abscess,

recommends the removal of the appendix only when readily accessible. His belief is that the operation is not to remove the appendix, but to save the patient's life, and he thinks that the associated traumatism, which must necessarily occur when groping round amongst extensive adhesions for a buried appendix, must open up fresh avenues of infection. On the surface this appears to be reasonable, but it is my opinion, based on my own experience, that there must be very few cases indeed in which an appendix cannot be removed and I have yet to see any ill results following extensive breaking down of adhesions in the effort to locate the original cause of the trouble.

After-treatment. In simple, uncomplicated cases as described, the abdomen is closed completely, the patient kept on fluids until the third day, when an ounce of castor oil, followed by an enema, will empty the bowels, after which a general diet may be gradually resumed. In certain cases, where even if perforation has not occurred, there appears to be some exudate of a murky serious character, it is safer to drain although Elder,[7] in an address to the Saskatchewan Medical Association, two years ago, said, "When in doubt don't drain." This appears to me like inviting the devil to shake hands with one and looks like taking perfectly unnecessary risks. I should much prefer to insert a small drain for twenty-four to thirty-six hours, when, temperature and pulse remaining normal, it may be readily removed and the wound allowed to close, but in the event of any infection being present it will find an outlet and not diffuse itself throughout the whole peritoneal cavity, where it may produce sufficient damage to end matters rather seriously for the patient.

The simple cases are permitted to sit up in bed about the fifth day, out of bed after the sutures are removed and allowed to walk by the ninth or tenth day, and are, generally speaking, able to get about with every degree of comfort by the third week.

In cases requiring drainage the tubes are exhausted and aspirated from four to six hours and at longer intervals as the secretion diminishes, for whatever time is necessary, the large rubber tube being removed as soon as it is deemed safe, smaller ones substituted, or even simple gauze drains used.

All of these cases are, on their removal from the operating table, placed in the Fowler position and a proctolysis at once instituted. The Fowler position may, at times, cause gastric distress and vomiting, due to the dragging on the jejuno-duodenal fold, but this can at once be relieved by lowering the bed. After

the lapse of twenty-four hours fluids may be permitted by mouth. The drainage tube in the wound is shortened from day to day according to indications, and as a rule the wound is closed in about three weeks' time.

In severe cases with general peritonitis, in addition to the Fowler position and the Murphy drip, it is generally desirable to give a high enema every four hours of soap suds, to which are added a drachm of turpentine and 20 to 30 grains of quinine. Should the soap suds enema not be effectual in reducing distension, physostigmine in doses of one fiftieth of a grain, every two hours for six doses, is frequently very effectual. Where the toxæmia is intense with a rapid and running pulse, intravenous saline injections containing pituitrin, should be given if necessary twice daily, and are more effectual than any other means at our command.

Camphor and strychnine are but temporary expedients at best, and have but little place in our therapeutics, and cannot be depended upon to have any lasting salutary effect. Unsurgical as they may appear, hot turpentine stupes undoubtedly give relief in cases of peritonitis with paresis of the bowels and the associated great distention, and patients, as a rule, express their sense of comfort when these hot applications are applied. For the vomiting that occurs frequently in cases of general inflammation, lavage of the stomach gives more relief than almost any other measure and should not be neglected.

Should deep pelvic abscesses develop, which show themselves through later rise of temperature, pain in the lower pelvis, difficulty in micturition and a sense of pressure in the rectum, it is always advisable to make a rectal examination, when frequently a large bulging mass may be felt through the anterior rectal wall, and here it may be possible to drain by a free incision through the rectum with the insertion of a rubber tube, which will generally be spontaneously discharged, as the abscess cavity is drained and its walls collapse.[8] In women these pelvic abscesses should be drained by the vagina. Unsurgical as it may appear, and with the apparent possibility of secondary infection from the rectum, it has proven practically to be of the greatest value and followed by the most beneficial results, avoiding further abdominal operations with the difficulties which are necessarily associated with the draining of fluids up hill[9].

Chronic Appendicitis. Cases of chronic appendicitis as a rule give a history of more or less constant distress in the right iliac region, almost always associated with constipation, sometimes with occasional attacks of diarrhœa, and frequently with gastric symp-

toms. There seems to be a close connexion between this class of case and pyloro-spasm and duodenal ulcer. Aaron[10], of Detroit, found experimentally that pressure over the appendix induces pyloro-spasm and causes contraction of the first part of the duodenum, and reports a case where this is shown by using the fluoroscope. This is easily understood when we consider that the appendix has a large nerve connexion with the superior mesenteric plexus of the sympathetic, and with the cardiac, hepatic and gastric plexuses; so that the ætiology of gastric neuralgias and the hyperchlorhydria associated with chronic appendicitis is clear, and may explain the occurrence of duodenal ulcer in chronic appendicitis, an ischæmia being produced, permitting the gastric juice to attack the mucosa whose resistance is lowered. In these chronic cases too, a routine analysis of the gastric contents should always be made.

In many of these cases it is well to bear in mind that frequently the removal of the appendix alone is not sufficient to give the relief which the patient is led to expect. A certain percentage do get relief, where the symptoms have been due, in no small degree, to vascular changes which followed previous acute attacks, with the development of sclerosis of vessels, thrombi and end-arteritis, and changes in the nerves due to pressure of adhesions and cicatrices, which result in chronic neuralgias, so called, If, however, in another large percentage of cases, we neglect to relieve pressure from bands of adhesions which extend their influence over the terminal portion of ileum, the cæcum and ascending colon, or neglect to fix a preternaturally mobile cæcum and content ourselves with removal of the appendix alone, we are doomed, alas, to disappointment and will have the melancholy satisfaction of having back on our hands patients, more particularly women, who make life miserable for us and inflict their recriminations on us and cause the whole operation to fall into disrepute. It therefore behooves us in all these chronic cases, to explore that whole segment of the abdominal cavity thoroughly and try to discover all possible mechanical and other causes which may have had a bearing in the production of the symptoms, for the relief of which these patients have consulted us. Neglect to do so will only invite disaster for ourselves and will not enhance the reputation of the particular surgeon in question.

Hausmann[11] first drew attention to the factor of the mobile cæcum and mentions that "It is not necessary to have even a long meso-cæcum to produce trouble, but that a mesentery of the ascending colon and hepatic flexure may, by permitting rotation, give the signs of distress which are generally ascribed to a simple chronic catarrhal appendicitis."

End Results. In respect to the end results following operations for appendicitis, the best results are obtained in acute conditions operated on early, as it is the exception in these cases to have any complaints arising on the part of the patient in after years. Statistics, on the whole, are not particularly satisfactory as the patient is discharged "cured" from the hospital if he recovers from the operation. Lichty,[12] out of a series of 248 chronic operative cases which he followed up, reports satisfactory results in 50 per cent. In 10 per cent. no beneficial effect resulted from the operation in respect of the symptoms complained of, and 16 per cent. reported exceedingly unsatisfactory results, and in regard to the latter one may perhaps assume that other conditions, such as movable kidney, Lane's kinks, ptoses and unrelieved adhesions, were probably the reason for the further continuance of symptoms which drove the patient to the surgeon for the removal of his appendix. Were we in England, I have no doubt a large percentage of these cases would gravitate to Lane's clinic at Guy's Hospital.

Summarizing

1. Early diagnosis and close coöperation between physician and surgeon.

2. Early operation takes only a few minutes for its performance, has a low mortality and is least likely to be followed by serious complications.

3. In chronic cases remember associated complications such as "veils," peritoneal bands and adhesions, mobile cæcum and colon, digestive disturbances, and do not neglect the analysis of the stomach contents.

4. Remember that the end results of operations for chronic appendicitis are least satisfactory.

References:

1. Turner, *British Medical Journal*, June 12th, 1915, p. 993.
2. deQuervain, Schweiz, *Rundschau für Medizin*, 1913, Nos. 4 and 5.
3. Kocher (ibid).
4. Von Arx, Schweiz, *Rundschau für Medizin*, 1913, Nos. 4 and 5.
5. Van Buren Knott, *Journal American Medical Association*, Vol. lxii, p. 1004.
6. J. E. Moore, *Journal American Medical Association*, Vol. lxiii, p. 757.
7. Elder, *Canadian Medical Association Journal*, February, 1915.
8. Schrager, V. L., *Surgery, Gynecology and Obstetrics*, Vol. xxii, p. 482.
9. A. MacLaren, *Journal American Medical Association*, Vol. lxiii, p. 755.
10. Aaron, *Journal American Medical Association*, Vol. lxiv, p. 1845.
11. Hausmann, *Zentralblatt für Chirurgie*, Vol. xli, No. 3.
12. Lichty, *Pennsylvania Medical Journal*, January, 1915.

EARLIER DIAGNOSIS OF PULMONARY TUBERCULOSIS

By H. A. Farris, M.D.

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EARLIER diagnosis of pulmonary tuberculosis is essential both for preventative and curative medicine. There are many cases of open tuberculosis, who have never suspected the disease, who are taking no precautions to protect their associates and are steadily growing worse themselves. There are at least five hundred deaths a year from tuberculosis in New Brunswick. It is difficult to get an agreement on the average duration of the disease, but five years seems to be a fair estimate. This means there are twenty-five hundred active cases of tuberculosis in New Brunswick. Yet it is a safe guess that there are not over seven hundred diagnosed cases. The great need of diagnosing and treating cases as a preventative measure was shown by Dr. Pryor, of Buffalo, who examined one hundred and thirteen families in which a death from tuberculosis had occurred, and he found 40 per cent. of the members of the families had demonstrable tuberculosis. The great susceptibility of children to the infection was demonstrated by Alfred Hess, of New York. He had ten babies in a hospital ward where every precaution was taken against the babies becoming infected by tuberculosis. On admission three of the babies gave a positive Von Pirquet. A nurse, who it was later found had tuberculosis in her sputum, cared for these children for six weeks; nine months later the ten children gave a positive Von Pirquet, while in other wards of the hospital, there was no change in the Von Pirquet reaction. This demonstrated not only the great danger of infection of children by unsuspected cases of tuberculosis, but also the importance of examining exposed cases. The twenty-five hundred cases of tuberculosis in this province need to be located, cared for, and educated in a definite, clear-cut manner. In the so-called incipient stage, 90 per cent. should make a good

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recovery, 40 per cent. would be a high average for the moderately advanced, while of the far advanced stages very few can hope for anything better than an improvement in their condition. Every day of delay in diagnosis and treatment diminishes the chances of the patient's recovery. Of the probable eighteen hundred undiagnosed cases in this province a number of these have never consulted any physician, but the majority of them have been treated for one illness or another, probably, the diagnosis of neurasthenia has been the most frequent one. G. D. Head in the *Journal of the American Medical Association* in 1914 said regarding concealed tuberculosis: "This symptom type is the symptom complex, now recognized by clinicians the world over as neurasthenia." Bronchitis, run down condition, menopause, indigestion, are the common diagnoses made in the early stages of the disease. At the stage of the disease of many of these cases the diagnosis is not easy and would require every aid in making the diagnosis, but a large percentage could be recognized without much difficulty if the physician believed in the need of early diagnosis and treatment, and so was on the lookout for the disease. In the past there has been little inducement to the physicians to spend a great deal of time in making an early diagnosis, as they were more or less helpless regarding treatment in the majority of cases. Sanatoria, however, have done a great work, by treating only the more curable cases and so educating the public that tuberculosis is a curable and preventable disease. Now that the public are convinced it is worth while to make some sacrifice in the attempt to regain their health it is no longer difficult to get them to take medical advice even if they cannot go to an institution, and especially can they be taught to protect others. The diagnosis must be explained explicitly as soon as it is made. There should be a health insurance such as adopted recently in England, so that when the wage earner becomes ill his family can have some financial assistance. This insurance would also provide for medical attendance and thus assure earlier diagnosis.

The dispensary must be very greatly developed, even country districts should have some form of dispensary or visiting physicians, the dispensary should be the centre of the tuberculosis work, and act as a distributing agent. The great use of the dispensary is to diagnose tuberculosis in these patients who cannot afford to pay for a thorough medical examination. The physician at such a dispensary has an opportunity of becoming more or less expert in the diagnosis of tuberculosis, so that every district may have a man

giving special attention to tuberculosis. The nurse at such a dispensary is possibly of even more importance than the physician as it is her duty to follow up the exposed or suspected cases, so that many cases of early tuberculosis may be found. There should be a great extension of free institutions; these should not be considered charitable, but on the same basis as public schools; the sanatorium should now no longer have to depend for its existence on private philanthropy, and should be more or less national, and every county or perhaps two or more counties together should have a hospital for advanced cases. Thus with the dispensary, the sanatorium for early cases, the hospitals for advanced cases and a health insurance, there will no longer be the plea of the lack of finances to make earlier diagnosis and treatment possible.

Even, however, in well-to-do patients has the diagnosis been overlooked. This is partially explained by the large number of cases of inactive tuberculosis seen in general practice, and the active case goes down hill so slowly with its period of apparently complete recovery, that the busy practitioner becomes indifferent to the diagnosis and does not appreciate the need of very definite treatment. Although over 90 per cent. of people have tuberculosis they do not have demonstrable tuberculosis. Every case of demonstrable tuberculosis should be diagnosed and then the case decided on its merit, whether it needs treatment or not. There is no harder problem in medicine that that of deciding what tuberculous case needs treatment. With the diagnosis of tuberculosis made, and the patient told of the diagnosis, then if the disease is not considered active the patient can be watched carefully and examined at least once or twice a year and at the first appearance of activity definite treatment instituted. The futility of advising patients to go to the country for rest, to take good food and plenty of rest and fresh air without strict supervision by the physician can only be appreciated by those who have continued to go down hill under such advice and treatment.

With the busy practitioner, the question of time needed to make a diagnosis is a most important one, but there is no way to get away from this; if the patient is poor he should be sent to the dispensary, if he is not poor he should be charged a fee that would warrant the time needed being spent on him. To make a diagnosis of early tuberculosis requires at least one hour, and some of the best men require even longer. Tuberculosis can often be diagnosed only by exclusion and an examination of the chest alone is rarely justifiable. Once a physician has recognized the importance of

early diagnosis and is willing to spend the needed time on the patient he will be startled at the number of cases of tuberculosis he will find, and will be surprised at the improvement in his technique, giving him earlier and earlier diagnosis.

The importance of a systematic thorough history is greatly under-estimated. Many cases can be diagnosed by a properly taken history, yet the physical examination might reveal little or nothing. The family history is very important; while tuberculosis is no longer considered hereditary, yet according to Carl Pearson's statistics, the lowered resistance follows Mendel's law; not only this, but it is very generally recognized now that tuberculosis infection occurs in childhood, becoming active later when there is some special drain on the system, so that any case of tuberculosis in the family especially during infancy of the patient is most important. The past history should be followed out thoroughly and history of pleurisy meaning active tuberculosis within seven years in 45 per cent. of cases, history of blood spitting which is almost pathognomonic, morning cough, loss of weight, even slight expectoration, are all very important. Contrary to the general belief early cases very often suspect tuberculosis and any one who suspects he has tuberculosis should not be dismissed lightly, every system of the body should be gone into thoroughly, as often something most unexpected will be brought out that would be overlooked if not specially inquired about. If the history is written down it is surprising how much more one will get out of it especially in a differential diagnosis; the line of questioning is to be suggested by each case.

Next to the history perhaps the temperature and pulse record can be placed as not only is the temperature and pulse record needed for diagnosis, but the line of treatment depends largely on the history and condition of temperature and pulse rather than on physical findings. The patient should be at rest for one hour. The temperature may be taken in the mouth, the thermometer should be under the tongue at least five minutes to give a correct reading, if it is suspected that the mouth temperature is not correct the rectal temperature may be taken allowing three fifths of a degree and this may reveal occasionally that the patient is running a little fever not shown by the mouth. The question of normal temperature is a much disputed one; especially the European men claim even $99\frac{3}{5}$, particularly in women, to be normal, but personally I have never known of such a normal temperature excepting in one man who was given a certificate by one of the best men at Johns Hopkins, that his normal temperature was $99\frac{3}{5}^{\circ}$.

Three years later I met this man, a chronic case of tuberculosis, at Saranac Lake. It seems as if a temperature of 99° or over for three days or more without any explainable cause is very suspicious of tuberculosis. This is very much strengthened if the early morning temperature is sub-normal, so that there is a variation of over 1½° a day. In early cases the temperature is sometimes normal, but if the temperature is taken every two or three hours a day it is surprising how few of even the early cases run a normal temperature. In those with a normal temperature occasionally, a brisk walk of one to two miles will send up the temperature and it will not drop in one-half hour as it would in a normal person. A post prandial or a premenstrual rise of temperature has been looked upon as normal, but now even this elevation is regarded with suspicion, and in most cases of tuberculosis there is an increase in the pulse rate and an unexplained pulse of ninety or over is very suggestive of tuberculosis. Other causes of fever such as pyorrhœa alveolaris, disease of the accessory sinuses, obscure pelvic disease, etc., must all be carefully excluded.

As regards physical examination there are a few points to which I would like to call special attention. The findings should be recorded both for immediate and future reference. Inspection is very important and is greatly neglected. The patient should have the clothing removed to the waist, and should be seated comfortably in a warm room; the warm room is rarely found in a doctor's office, yet this is very important, a cold room may cause a rigidity of the muscles to alter the percussion note, or may cause muscle rales, which can easily deceive the examiner. The head should be drooped forward with the arms hanging loosely by the side. Observe the patient as a whole, condition of skin, then the chest for depressions, immobility of acromium, angle of Louis, prominence of the sterno-clavicular joint, which is said to point to the diseased side. Diminished or delayed expansion although very important in the adult does not mean so much in the child. Inspection perhaps shows more of the patient's general condition than of the chest condition, in the early stages of tuberculosis, but even in early cases it is important, especially for differential diagnosis. Palpation should be carried out thoroughly, all the lymphatic glands, especially the supra clavicular and abdominal glands should be palpated, a large percentage of apparently normal persons have enlarged cervical and axillary glands. Recently it had been claimed that even in early cases the trachea is pulled over to the diseased side, and this should be palpated with the thumb first on one side, then

the other, just above the sternum, palpation will probably show diminished or delayed expansion better than inspection, but one must be careful not to be deceived by suggestion. Tactile fremitus is best tested by light touch of the right hand. Diminished fremitus may be found over some area of old pleurisy, but outside of this there is rarely much change in fremitus in the early cases. Muscle rigidity over a new lesion and wasting over an old lesion may be looked for, any tenderness should also be noted.

Percussion is now coming into more and more prominence, and many men claim even more for percussion in early diagnosis than for auscultation. The change in the view point regarding the value of percussion is due to the change of method. It is now recognized that the lightest possible percussion gives by far the best results. While theoretically percussion should only show gross lesions, practically very light percussion shows an altered note very early in the disease. The room should be perfectly quiet and no one moving about or whispering, the physician should be seated comfortably within easy reach of his patient; he should use a flesh pencil to mark his findings, and he will be surprised at first at his varied findings if percussion is checked by the flesh pencil. Corresponding areas over the two sides should be very lightly percussed, then percussed very lightly and rapidly from below upwards, on each side. There should be no appreciable difference in the note going from below upward, excepting possibly at the second rib ant., and in muscular persons over the rhomboid muscles, where the note may be a little high, heavy percussion may later be tried to see if the dullness is superficial or deep. Mark out Krönig's isthmus and this may show quite a retraction even in fairly early cases. Percuss over sternum, over the vertebræ and alongside the vertebræ, looking for bronchial gland enlargement. Riviere says dullness at the apex of upper and lower lobes of a lung is pathognomic of tuberculosis.

Auscultation is what most physicians depend on entirely for diagnosis, yet auscultation probably takes better training both in hearing and interpreting abnormal sounds than any of the other methods. There is no need to mention the changes in breath sounds that may be found; but the importance of comparing the inspiratory and expiratory sounds over corresponding areas of the lung is often overlooked, because harsher breathing is expected at the right apex this often causes a gross lesion to be overlooked, at the right apex. Listen carefully over every bit of the thorax, and listen to the full inspiration, in distant breathing sighing breaths may bring out

bronchial breathing. In listening to voice sounds many look for bronchophony or whispered pect. instead of voice changes or differences on the two sides. Bronchophony or whispered pect. over the first to the fifth v. s. is suspicious of adenopathy. In auscultation, probably rales are of more importance than the breath sounds to the average man, as they are much easier to hear and interpret. Rales are not found in the earlier stages of the disease, and when rales can be heard in quiet breathing the case is no longer early. To bring out the so-called latent rales let the patient breathe out and just before the end of expiration give one or more chest coughs followed by a deep inspiration; this will bring out many rales not otherwise heard, a cough during inspiration is too loud and not nearly as effective as that during expiration. The expiratory cough will often be a great help in diagnosing between pleural and intra-pulmonary rales, although even pleural rales are sometimes increased by cough. Rales of different kinds are really of about equal importance as far as presence of disease is concerned. The location of rales is of much more importance. Permanent rales at an apex have been considered diagnostic of tuberculosis, but Riviere says that fine rales at an apex may be caused by a simple catarrhal condition. Price, of London, says tuberculosis should never be diagnosed on one sign alone, but requires some corroborative sign. There are spurious rales that must be carefully excluded, gas in the stomach may produce sounds that will simulate rales, to be heard even at the apices, muscle rales, especially in the scapular regions, swallowing of saliva, joint crackle, may all produce sounds that may be mistaken for rales. A case may become advanced chronic without having any rales that can be heard.

Sputum examination is very important, but a positive examination is of very much more importance than a negative examination, as tuberculosis bacilli are ocasionally absent even in advanced cases. In examining for tuberculosis bacilli the stain should be made up with freshly distilled water, as distilled water that has been standing for some time may contain acid fast bacilli. Sputum containing many lymphocytes is strongly suggestive of tuberculosis. The albumin reaction is considered of some importance in differential diagnosis as this is supposed to show inflammation of the alveolar tissue; the various blood tests can be of little value to general practitioners. An Arneth count is really of no diagnostic value.

The *x*-ray is now a very great aid and may show cases of concealed tuberculosis, especially tuberculosis of the bronchial

glands, and in every doubtful case the *x*-rays should be used if possible. The fluoroscope may be of some assistance. The Von Pirquet test is of little value excepting in children under four years of age, when a positive reaction practically means active disease. A negative reaction in an adult is of some importance but the better one's technique, the fewer negative cases will be found in adults. The intracutaneous will probably replace Von Pirquet test. The subcutaneous test will rarely be used by the expert, and in the hands of one not thoroughly familiar with the test there are great possibilities of serious harm being done. Added to all the above will often be needed many tests such as Widal's, Wassermann, blood counts, urinal analysis, etc., to exclude other diseases, as tuberculosis at times may only be diagnosed by process of exclusion. To say a patient positively has not tuberculosis is to say something one cannot be sure of. One may say that he cannot find any evidence of tuberculosis and after he has exhausted every means for a diagnosis he can only be reasonably certain tuberculosis is or is not present. To know whether a case needs treatment or not may require careful observation for weeks.

In making earlier diagnosis of tuberculosis, the first essential is to believe in the need of the diagnosis and that it cannot be made in a few minutes time, then comes history of the case, a record of the temperature and pulse, physical examination, of which light percussion and expiratory cough are of the greatest importance. Laboratory methods, the use of the *x*-ray, and as a last resort tuberculin may be used. After all errors of omission are worse than errors of commission, and it is errors of omission that cause so many delayed diagnoses. If the physician waits until he can make an absolutely positive diagnosis in many cases he will wait until it is too late.

In a report to the Ottawa Board of Control on the water supply of that city, Mr. Joseph Race, the city bacteriologist, stated that the cases of typhoid fever reported in Ottawa during the year 1916 numbered 10, three of which died. This is a great improvement upon the years 1911-1912 and when 1,160 cases and 76 deaths, and 1,300 cases and 84 deaths, respectively, were reported. In 1913 there were reported 90 cases and 14 deaths; in 1914, 86 cases and 9 deaths; and in 1915, 47 cases and 12 deaths.

NOTES ON SPECIAL WORK IN A FIELD AMBULANCE

By Captain Percy G. Bell, C.A.M.C.

ANY consideration of work of field ambulances in the present war demands an understanding of the varying conditions under which these units are obliged to work. The advent of the present system of trench warfare with fixed positions tends to transform mobile medical units into more fixed stations. Thus a field ambulance, less its advanced dressing station, is frequently doing work of clearing hospital nature. This is noticeable, for instance in the case of the 1st Canadian Division, which from the time of its arrival in France was able generally to work its front with two field ambulances, leaving the third to act as a Divisional Rest Station, usually at a point four to six miles behind the line.

In open fighting the ambulance problem is rapid collection and evacuation, and in the present operations a third factor becomes relatively of increasing importance; that is to say, the saving of every possible man to the battalions.

The field ambulance should take on a sieve-like nature, reminiscent of the biblical eye of the needle, for all sick sent down by the regimental medical officers and that because, if a man becomes involved in the cogs of the lines of communication machinery, he is lost for a considerable time to his unit. The ambulance carrying on the Divisional Rest Station is able to return a number of such cases to duty, cases which are held if they are likely to be fit within ten days or so.

The rest station is generally situated in some fairly large building; a schoolhouse, convent, farm or factory, and here the unit carries on as efficiently as possible with the means at its command. The patients are of the class who have temporarily broken down under active service conditions, rheumatism, carious teeth, painful trench feet, "trench fever"—eye, ear, nose and throat conditions, and the like. Stretchers serving as beds, although not proverbially soft couches, may under the circumstances be relative luxuries. A bath house is essential also, and the establishment of this gives rise to the exercise of much ingenuity, especially in villages where

water may be scarce and the pump is guarded by a water detail with a diligence that outside of the war zone is not usually expended on such a fluid.

Gastro-intestinal cases we found to be benefitted by the free use of a pure bottled water which we were able at times to purchase locally, thanks to the gift of a sum of money from friends in Canada.

It happened in this field ambulance that most of the officers had been doing special work in civil life in Canada and the officer commanding tried as far as possible to take advantage of this in distribution of cases, as it is obvious that the best results would be so obtained. In this way, too, probably more interest of a purely medical nature was felt in the cases than otherwise would have resulted. This applied of course to work either in the main part of the ambulance during ordinary line work or the periods at the rest station.

Those of us who happened to be stretcher-bearer officers took turns at the advanced dressing station during which time the work was transportation rather than medical. We always referred to this as the "soldiering" part of our career. The advanced station was no place for special work. It was usually situated in a farm building about a mile from the line and at varying distances from the main ambulance from about a mile, to, in one case, about eight miles.

Ideas of field medical work in former wars have had naturally to be modified under the conditions of modern artillery fire. Military text books, in speaking of the choice of an advanced dressing station, lay down the axioms that the place should be away from main cross roads and not near guns, etc.

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As far as eye, ear, nose and throat work is concerned, no special arrangements exist in an ambulance. The equipment of a special nature provided consists of a mirror, a lens and an ear syringe. These together with some private instruments and a few authorized to be bought specially, make up the armamentarium. An ingenious sergeant fitted up an examination lamp for me out of a few pieces of wood and a bicycle lamp which he connected with our portable carbide lighting plant. A dark room could generally be arranged in a cellar, or fundus cases could be examined at night.

During an action when wounded were being evacuated as fast as possible special dressings have to be applied. At Ypres we had an imperative tracheotomy case or two and a number of gunshot wounds of the face involving eyes, ears and nose. I do not con-

sider that enucleations of the eye should be carried out in a field ambulance except under very exceptional circumstances.

In a short paper like this there is not time to go into a classification of the various wounds of organs of special sense but there are several classes of cases whose importance and frequent occurrence justify a few words. Nerve deafness due to the intensity of gun-fire is important, not only from its frequency but also on account of the relation it will bear to the question of pensions after the war. The time has been too short to work up a very satisfactory pathology of this condition as a knowledge of the permanent results cannot yet be obtained. The most satisfactory hypothesis at present seems to be damage to the cochlear threads. It would appear desirable that as far as possible the gun squads be supplied with some form of ear defender. Many of the types which are upon the market have proved very useful in absorbing shock without at the same time interfering markedly with the perception of voice sounds. The preservation of hearing to the men at the front is of the greatest importance.

Wounds of the head occur frequently as in the case of men looking over the parapet or being hit with the fragments of shrapnel, etc. Any wound of the eye occurring under such circumstances is likely to be serious, whereas such an injury to other parts of the face may be relatively trifling. The steel helmets which the French infantry wear are said to have decreased the number of such wounds to a notable degree. The same is true of the British helmet now supplied to our men at the front. In a number of cases men were brought into the dressing station with almost total enucleations performed by fragments of shrapnel. The pulping damage done to the eye by a rifle bullet is of course great. Rifle bullet wounds in trench warfare appear to exhibit their great destructive power partially owing to the fact that the modern bullet in taking its spin from the rifle does not settle down to a smooth flight for about three hundred yards and this is less than the average for distance between the trenches.

A type of case rather frequently met with is a concussion injury to the eye-ball caused by impact of a bullet or shell fragment near the bony walls of the orbit. Various degrees of this may be found in which the injury varies from a rather severe commotio retinæ such as is seen in civil life, to ruptures of the choroid and in one case which is called to mind, of fracture through the wall of the canal with optic atrophy following injury to the nerve.

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During periods of the ordinary life of the line, and in the tent division of the ambulance, quite a large number of special cases appear for treatment. These are much the same as one might see in practice anywhere; cerumen, otitis media, furuncles, various nasal conditions, tonsillitis, laryngitis, foreign bodies in the eye, conjuctivitis and accidental injuries. Many of them demand quite simple treatment, which, if given early, will suffice to return a man to his duty. In some, especially in cases of malingering, a decision communicated to the regimental medical officer, is all that is required. Many men become anxious about a running ear or something of that sort and if reassured will return cheerfully.

In conclusion it may be said that, although no provision has been made in the ambulance for officers doing special work, other than dentists, it has so happened that there has always been a specialist with one or other of the field units. Our cases for refraction we were able to send to an R.A.M.C. Stationary Hospital. No Casualty Clearing Station with which we were in communication had facilities for any special work.

The seventy-second annual meeting of the Montreal Maternity Hospital took place on November 23rd. The number of patients received into the Hospital during the year ending October 31st, 1916, was 1,034, rather less than during the previous year, when 1,135 were admitted. Of these patients twelve died, as compared with eight during the previous year, which is explained by the fact that a larger proportion of serious cases are now sent to the hospital. The births numbered 1,051, including twelve pairs of twins. Fifty-three deaths of infants were reported, death occurring before delivery in sixteen cases.

A CASE OF SHELL SHOCK

By Captain Edward Ryan, C.A.M.C.

Orpington Military Hospital, Orpington, Kent

PRIVATE F. was admitted to the Ontario Military Hospital on June 8th, 1916. He was both deaf and mute. The patient was born in London, England, on September 5th, 1890.

Family history: father died at age forty-two, does not know cause of death. Mother living, aged forty-seven. Three brothers living, one sister living. None dead. Previous health was excellent.

He went to Canada in 1905 and enlisted in the 33rd Battalion in London, Ontario, in August, 1915. He was transferred to the C.M.R. on March 26th, 1916. He landed in England on May 26th, 1916. On May 28th his unit went to France. He was in the trenches thirty-six hours, then his unit was ordered to make an advance. They drove the enemy back three times; on June 1st, 1916, a shell blew in his dug-out, killing all his companions. He was rendered unconscious for a time. On recovering, his ears were ringing and his voice was very low. He crawled back to a machine gun which he turned on the enemy. Another shell blew him up and he again lost consciousness. When he came to, he was being taken to a dressing station. He had a violent headache and was completely deaf and mute.

On entering the Ontario Military Hospital he complained of headache. There was pain and tenderness along the course of the seventh nerve well up in the temporal region and pain also across the frontal region. There was pain also along the course of the posterior auricular. He was absolutely deaf. He could not speak, whistle or laugh. There were no marks of external violence. There were no organic lesions.

The psychic manifestations were both pronounced and interesting. The patient was oriented in time, place and person. His memory for past events was undisturbed. For recent events, his recollections up to the time of shock were quite clear. Here the

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train of events was broken and the patient has but a hazy knowledge of even such rather special events as his lumbar puncture. The patient was quite depressed. He had a strained and anxious appearance. Something had gone wrong with his life and he seemed to be struggling hard to adjust the train of events. He would rest on his elbow with his hands in constant motion. His lips were frequently moving as though he were talking to himself There were fallacious sense perceptions, especially of hearing. The patient maintained he heard the noise made by the bursting of shells, the explosion of mines, the crack of rifles and the general din of battle.

He had but little insight into his condition. He stoutly maintained that his hearing was all right but those conversing with him would not speak aloud. He would frequently write, "Why do you not speak out so that I can hear you?" He was irritable and peevish and these characteristics were increased when the physicians, nurses nnd visitors were present, and were more evident during the first few days of his residence in the hospital. The only delusion observed was one that his friend who, by the way, was in another part of the hospital, had visited him and had remained with him all night. He had talked with his friend and fully expected that he would come again and remain with him.

There was nothing unusual in his conduct. Of course he was kept in bed and under close observation from the time of his admission until improvement was quite manifest. The only incident was his writing that he hoped the barber who came to shave him would make a clean job of him, indicating what he meant by drawing his finger across his throat. Of course we had taken precautions against suicide and a nursing sister was in attendance day and night during his period of depression. He was quite emotional and would weep without any discernible cause. There was considerable clouding of consciousness. He was receiving but few impressions from the external world. On the evening of June 13th, he received a letter from his friend which he read carefully. On the following morning he was very excited. Of course he fully believed that "Bill" had spent the night with him and that they had talked together for hours. He was quite at a loss how to account for the letter and evidently was labouring considerably to adjust the sequence of events. On that morning he began to speak to the nurse wanting to know why she took his friend away. His voice at first was thin and almost indistinct, but it has gained in volume daily. Since he was really convinced that he could talk, of which

at first he appeared in doubt, he has improved rapidly. He has gained eight pounds in weight.

He is still absolutely deaf; this fact, however, does not appear to worry him very much. Having one faculty restored, he seems quite contented, fully believing that in time he will be able to hear all right. At present he is quite cheerful and happy and I would say that, with the exception of his hearing, he had regained his normal condition.

The causative factors in cases of his character have given inspiration to a vast amount of literature, to opinions, theories and speculations of endless variety. I think, however, it is now generally conceded that the condition is purely psychic, but that trauma, and the idea of a trauma are contributary or predisposing causes. Mott says: "I believe this mutism is due to functional paralysis of the voluntary cortical nervous centres which control phonation, for many cases cannot produce any audible sound, for they are not only unable to talk or whisper, but to whistle, to utter a cry or to laugh aloud." I think also that other obscure conditions, the hysterias, anæsthesiæ, paralysis of limbs, of various groups of muscles are purely psychic though the idea of trauma may be present. Cases of deafness and mutism follow a bombardment where the patient for the time being can hear no other sound not even the sound of his own voice. Of course there can be no doubt that the detonation caused by high explosives exerts considerable cerebral pressure. The investigations of Lord Sydenham prove that in many cases there is a dynamic pressure exerted of ten tons to the square yard.

Mr. Arnaux, a civil engineer of Paris, has proved by experiment that the pressure exerted by exploding shells is equivalent to 10,000 kilos per square metre, which is even somewhat beyond the conclusions reached by Sydenham. What effect this pressure may have on the nerve cells it is hard to determine as post-mortem findings are not available. It is, or may be supposed, that the dendrons of the cerebral cells are temporarily paralyzed and the association tracts are thrown out of adjustment, if only temporarily. It is also suggested that pressure is exerted on the cerebrospinal fluid causing œdema of the cerebral cells with the consequent diminution of function.

In like manner the suggestion of injury is present, tremors, local palsies and in paralysis of limbs, the patient was blown against the parapet, sandbags struck him in the back or arm or legs. There may be no evidence of any injury, no wound, no tenderness, and

yet the arm is numb, or the region paralyzed, as in the case of a bursting shell the influence is purely psychical.

The general condition of this patient would indicate a psychical rather than a physical trauma. There is scarcely a patient in the ward who does not, each in his own way, contribute to this evidence. The depressed or excited expression, the areas of anæsthesia, the cold blue perspiring extremities, high pulse, quickened respiration, low blood pressure, are pictures quite familiar to all who have to deal with the psychosis or the psychoneurosis. By the psychiatrist indeed these symptoms are met with daily.

Of great value in arriving at the causation, diagnosis, or a prognosis in these cases is correct information as to the mental and bodily condition of the patient at the time the shock was received. The influences may be—1. Hereditary: (*a*) a timid disposition; (*b*) a neuropathic or psychopathic inheritance. 2. Acquired: (*a*) lowered resistance due to alcoholism, syphilis, or previous disease or head injury; (*b*) nervous exhaustion due to mental stress, anxiety, insomnia, terrifying dreams, etc.; (*c*) bodily exhaustion from heat, cold and hunger, etc.

In many of the cases I have seen in the various hospitals the ear marks of degeneracy were observable and the histories of the cases confirmed the observations.

In our own wards at present two cases had syphilis, one a serious head injury, for nearly eighteen months two had been free drinkers, and one was a congenital defective. These cases will not stand the strain, they go down and out very early in the game.

The following cases will illustrate fairly well the types most frequently affected: Sapper H., father living, aged seventy-four. Has not worked as long as patient can remember, is very nervous and cannot settle to work and is said to have Bright's disease. Mother died aged fifty-eight, ailing for eighteen months, very nervous, had diabetes. Had four brothers, one died young, and one died on the street, the result of an epileptic fit, had the disease for years; one fell from the frame of a ship, and was killed; one living and well. Had two sisters. One has fits, the other is very delicate. Patient had fainting spells frequently when young, generally lost consciousness. Had these same spells several times since he entered the army. Joiner by trade, but was afraid to go on a building on account of fainting spells.

The treatment of these cases is interesting and satisfactory. It is of course essential that they be taken early. Each case must be judged on its own merits. No hard and fast rule can be laid

down. The idea of injury must be removed and all influences that will contribute to that end should be employed. Mott uses the expression, the "atmosphere of cure". This, I think, conveys the method admirably. We have used the hot packs, hot baths, continuous baths, alcohol tubs and massage with very good results. Rest in bed with forced feeding is always essential. We have not found that anæsthesia has been of any service. We employed it with the case recited without any result. The patient has now regained his hearing and is quite well. He will be discharged from this hospital in a short time.

A SANITARY corps composed of two surgeons, a physician, an assistant physician, and nine orderlies, recently left Paris for Bucharest

THE sum of one million dollars has been given by the General Education Board, and an equal sum by the Rockefeller Foundation, for the organization of medical instruction at the University of Chicago.

A HOSPITAL and training school for nurses was opened at Paris on the anniversary of the death of Miss Cavell. It is called The Edith Cavell Training School for Nurses and has accommodation for one hundred patients.

THE question whether the military medical authorities have the right to impose a particular treatment on a wounded man, and whether the military authorities have the right to punish in case of his refusal to undergo a certain treatment, was discussed in the Paris Chamber of Deputies. It was urged by Dr. Gabriel Maunoury that the interests of the nation must be taken into account and that it was most important that the wounded should be cured as far as possible. A resolution was passed finally, by 354 votes against 5, to the effect that the government should be vested with authority to treat the wounded in such a way as to reconcile the rights and liberty of the individual with the general interest of the national defence, provided that all soldiers, irrespective of rank or social position, were submitted to the same treatment as regards medical or surgical measures.

Case Reports

A FOREIGN BODY IN A TUMOUR OF THE ANTERIOR ABDOMINAL WALL

By Charles K. P. Henry, M.D.

Montreal

FOREIGN bodies are occasionally found in inflammatory masses in the abdomen after extrusion or rupture from the appendix, Mechel's diverticulum, or the intestine. Rarely such are found in the wall of the abdomen after passage through some part of the alimentary canal. The following reported case is an example of how free from symptoms such a migration may be.

Mrs. McG., aged fifty-three years, was admitted to the service of Dr. Von Eberts at the Montreal General Hospital on March 22nd, 1916, complaining of several minor ailments and a mass in the anterior abdominal wall. This was first noticed about ten days before, and had caused no pain nor had it been tender. There was nothing in her history of importance and there was a total absence of any history of digestive disturbances and of abdominal pain. She had attacks of pain in her head, apparently neuralgic, unassociated with nausea or vomiting. She was found to have a pendulous abdomen and save for a tumour the size of a hen's egg, just below and external to the umbilicus, the examination of the abdomen was negative. The mass was ill defined but was clearly in the abdominal wall, attached to and moveable with the contractions of the right rectus muscle. White blood cells were 9,600, red blood cells, 6,300,000; there were no occult blood in the stools and her systems were normal. The mass was considered to be a tumour arising from the rectus sheath, likely a fibroma.

The operation by me on March 28th revealed an interesting condition. On attempting to excise the growth, it was found softer than expected and was torn through; a soft centre of inflammatory tissue was exposed and, sticking upright in this, a pointed object

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was seen which I pulled out with artery forceps. This was a fish bone, about one and a half inches long, the sharp point nearer the skin surface and lying perpendicular to the plane of the abdominal wall. The mass of inflammatory tissue was dissected free and down through the rectus sheath and muscle to the peritoneum, a portion of which I had to remove with the tumour. Underlying this piece of peritoneum was adherent omentum which had to be tied off. At no point was there any adherent bowel and no hernia existed. The abdomen was closed and the wall repaired, leaving a drain to the rectal sheath as though there was no free pus in the mass, the centre about the fish bone was soft and probably infected.

The wound closed slowly and she was discharged April 24th, one month after admission. There was no history of swallowing the fish bone and nothing during the weeks before admission suggestive of the process of extrusion of the bone and its passage from the bowel to where found.

PYOSALPINX COMPLICATING ECTOPIC GESTATION

By John R. Fraser, M.D.

Royal Victoria Hospital, Montreal

THE association of pyosalpinx with ectopic gestation is of sufficient rarity to prompt the report of the following case.

Mrs. E., aged twenty-eight, was admitted to the Royal Victoria Hospital, Montreal, in the service of Dr. Chipman, on September 5th, 1915, with the following complaints: pain and tenderness in the hypogastrium, slight bloody vaginal discharge.

The history dates back to May 15th, 1915, when she had the last period; she was well till August 29th, when she was suddenly seized with severe colicky pain in the lower abdomen and brisk vaginal hæmorrhage, With rest in bed the symptoms subsided in a few days with the exception of slight vaginal hæmorrhage. On September 4th, after being up and working about the house, she was seized with severe colicky pain in the lower abdomen, especially

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on the right side. From this time on the symptoms became progressively worse, the pain increased in severity. There was vomiting and fever.

In her previous history one notes that she had two normal pregnancies, the last five years ago and in the past three years, two abortions. There have been no other illnesses.

On admission she was found to be acutely ill with temperature 102°, pulse 132, respirations 36, and she presented all the evidences of an acute infection. The heart and lungs were normal. The abdomen was moderately distended, the lower half being fixed, the respiratory movements were confined entirely to the upper abdomen.

The flanks were not bulging, there was tenderness and muscle spasm over the lower quadrants, the uterus was palpable lying in the mid-line slightly above the pubis. It was not possible to make out the appendages because of the tenderness. Per vaginam, there was some evidence of a previous gonorrhœal infection as shown in the swelling of the Bartholinian orifices and granulation of the vaginal mucosa. The urethra and Skene's follicles were free. A little bloody vaginal discharge lay in the lower vagina. The cervix was normally placed, firm and closed, the uterus was small, anteverted, and ante-flexed, and flexed. The posterior fornix was bulging and very tender. Through the lateral fornices it was possible to make out masses on each side, on the right the mass was more or less diffuse and easily the size of a grape fruit. On the left it was more clearly defined and the size of a small orange. The urine was normal.

As her condition did not warrant immediate intervention she was treated with stimulation and kept supported in Fowler's position. The following morning there was improvement in the general condition, pulse and temperature were lower. Toward evening abdominal pain and distress aggravated her condition considerably. Locally there was more bulging of the fornices, notably the posterior, and it was thought to be possible to map out masses, on either side of the abdomen low down.

On the morning of the third day all of these signs were more marked and operation was deemed advisable. The ordinary posterior colpotomy was done first and the presence of blood in the posterior cul-de-sac verified. A laparotomy was then performed. Clear fluid escaped in considerable quantity, the pelvis was found filled with a large inflammatory mass, covered with omentum, and when this omentum was lifted off and the true nature of things

revealed, a large tubo-ovarian abscess was found on the right and a ruptured tubal pregnancy on the left.

The right tube, ovary and abscess sac were removed first, then the left tube with gestation sac. The left ovary was left behind.

The pregnancy had occurred in the ampullary portion and rupture had occurred at this point into the free peritoneal cavity. A fœtus approximating seven weeks development was found in the centre of the blood clot at the point of rupture. The uterus was removed and vaginal drainage established. Before closing the abdomen three ounces of ether were injected. The course post operative was uneventful and she left the hospital in good condition.

The case may be said to be interesting from three standpoints, the obscurity of diagnosis, its relative rarity and its etiological bearing.

The symptoms on admission, pain in the lower abdomen of severe character, temperature of 102° with a considerable degree of peritonitis, associated with the findings on examination of bilateral appendage masses with a correctly placed uterus, together with the undoubted evidence of Neisser all prompted the justifiable diagnosis of bilateral salpingo-oophoritis, with an exacerbation.

Accordingly the treatment of rest in bed, in the Fowler position, ice bag to abdomen, and stimulation, was in just accord with the well recognized treatment of salpingo-oophoritis, "watch and wait" for the so-called "cold stage".

However, the rapid increase in the size of masses, the increased bulging of the fornices, the so-called crepitations (that is, the peculiar sensation imparted to the examining finger by blood clot) with increasing degree of shock, together with the history of amenorrhœa, all prompted one to the diagnosis of a possible ruptured extra-uterine pregnancy and led to the exploratory posterior colpotomy.

In a brief survey of the literature one is impressed with the rarity of the condition. Coues, of Boston, in 1911, reported a series of two hundred and fourteen cases of ectopic gestation with a review of the literature in which he found that roughly 16 per cent. of the cases only showed evidence of disease in the opposite tube and none showed such an advanced condition as this, the majority exhibiting a mild catarrhal salpingitis or a few adhesions about the fimbriated end.

The writings of Kaufmann, Aschoff and Bilroth are in accord with the above, i.e., in the large majority of cases the presence of

catarrhal changes in the tubes at most would represent the condition found.

Perhaps the chief interest centres in the light which this case throws on the etiology of ectopic gestation. At the 1911 meeting of the American Gynæcological Association, in the discussion of Dr. Smith's paper on "Recurrent ectopic gestation", the matter of etiology was dwelt upon by Drs. Chipman, Pollak and Fry. Dr. Chipman stated that the prevading opinion of the time in regard to this matter was to recognize two great classes of causes.

1. Those due to congenital causes;
2. Those due to inflammatory causes.

In the first group one notices a fœtal type of tube with imperfect growth, a tube which has a thin wall, poor musculature, thin mucosa, with an absence of, or a weak ciliary action and ofttimes persistence of the fœtal convolutions.

In the second or inflammatory type a previous inflammation usually of mild degree has caused destruction of surface epithelium with consequent loss of ciliary action; also there may be fusion of the mucosa folds or obliteration of the proximal end of the tube.

This case very well shows the effect of inflammatory processes on the tube and bears out the above statement. It is interesting to note that even with what appears to have been a sharp infection pregnancy should have occurred at all.

A SATISFACTORY report of the work of the past year was presented at the annual meeting by the Superintendent of the MacKay Institute for the Deaf and Blind, Montreal. Instruction has been given to seventy-one pupils and remarkable progress has been made. Both the Montessori and Braille systems have been used in the instruction of pupils. The report calls attention to the great need for an institute for the feeble-minded in the province of Quebec, where both instruction and medical treatment could be given.

Editorial

THE ASSOCIATION

A MEETING of the Executive Council of the Association was held in Montreal on Monday, October 30th, for the purpose of deciding on the place and date of the general meeting of the Association to be held in 1917. Montreal was unanimously chosen as the place of meeting, and though no dates were decided upon the feeling was that the most favourable time would be about the middle of June. The actual dates are to be fixed by the Montreal members of the Executive and will be made known at the earliest possible moment. The choice of the President was also left in the hands of the Montreal members, it being the unanimous opinion of the meeting that this officer should be a Montreal physician. In this connexion due consideration was given to a letter from the President-elect, Dr. McKechnie, of Vancouver. Dr. McKechnie placed himself in this matter entirely in the hands of the Executive, expressing the hope that the first meeting after the war would be held in the West.

The Executive also took up another important matter, namely, the position of those members of the Association who have gone overseas. Many of our overseas members have discontinued their JOURNAL and it was felt that an effort should be made to retain as many of them on the list as possible. It was therefore decided that in all cases where the JOURNAL was still being delivered membership in the Association should be retained on payment of the sum of $2.00 per annum, which represents the cost of the JOURNAL to the Association. The Council feels that this step will meet with general approval.

ELECTION OF PRESIDENT FOR ANNUAL MEETING

AS indicated in the report of the meeting of the General Executive the Montreal members of the Council met recently to elect a President for the June meeting of the Association. At this meeting there also attended several members of the Executive of the Montreal Medico-Chirurgical Society, as well as representatives of the city hospitals and of the general profession.

Dr. A. D. Blackader, Acting Dean of the Medical Faculty of McGill University, was unanimously chosen President, and Dr. W. S. Morrow, President of the Medico-Chirurgical Society, Vice-President. In naming these two officers those present felt that the success of the meeting was already assured. Acting Dean Blackader has always shown great interest in the affairs of the Association and has done splendid work as Chairman of the Finance Committee since the departure of Dr. Hutchison on overseas service.

Dr. Morrow has been an active member of the Medico-Chirurgical Society for many years and has contributed frequently to the JOURNAL.

The President has already named his Committee of Arrangements, and will at once commence the work of planning what is hoped will be a most successful meeting. The dates decided upon are June 13th, 14th and 15th.

This is a matter which concerns every member of the profession in Canada and the President bespeaks the hearty coöperation of all those who have the interest of the Association at heart. Let us have a banner meeting in spite of the difficulties under which we are working.

THE CANADIAN MEDICAL SERVICES

THERE has been recently published in the Canadian Press a series of articles purporting to be based upon extracts from a confidential report upon the Medical Services of the Canadian Expeditionary Force; and these have been made the

basis of a severe criticism upon the administration of that service. So representative of all branches of the profession has been the personnel of the Canadian Medical Services overseas, and so excellent have been the reports which have reached us of their work, that considerable surprise has been caused by the bitterness of this newspaper attack, particularly upon the head of the military services.

The medical profession of Canada has reason to be proud of the way in which the Medical Service had been gradually developed in the years preceding the war, and of the relative preparedness of the Medical Services at the outbreak of the war, due in no small measure to the enthusiasm and the ability of its director, Surgeon-General G. C. Jones. This feeling of pride has been strengthened by the efficient way in which his administration has coped with the numerous difficulties which beset his path in keeping pace with the remarkably rapid expansion of the Expeditionary Force.

We are relieved to learn in the last few days that the report of his deposition and of a change in the administration was premature, and that he has resumed his duties in London. It cannot but be felt that a great injustice has been done by the widespread publication of this confidential report, not only to him, but to the whole medical profession, and more particularly to its worthy representatives who have gone overseas.

It is only natural that in such a great undertaking as the rapid organisation of such a service, many mistakes should have occurred, but these should not cause us to lose sight of the value of the work that has been accomplished.

It is not our purpose at this time to dilate upon the various items forming the basis of the criticism, nor to enter into an enquiry into the arguments which might be raised in defence of the administration, which has been attacked. Nevertheless, the moment is opportune to touch upon one point which has been raised, namely, the large number of men who have been passed as fit by medical practitioners, and

who have possessed disabilities necessitating their discharge at a later date. While medical practitioners are undoubtedly greatly to be blamed for this state of affairs, there is much to be said in their extenuation. The competitive system of enlistment and the rivalry of recruiting and commanding officers in raising regiments in a short space of time, have had much to do with the enlistment of men who are medically unfit for the services demanded of them. Medical officers have allowed themselves to be overruled by the desire of the commanding officers to bring their regiments rapidly up to strength, losing sight of the fact that these unfits constitute a great charge upon the public. If the mistakes of the past and a grave waste of public funds are to be avoided in the future, the medical practitioner must put a higher value on the signature that he attaches to a certificate of medical fitness than he has done hitherto. And let it be pointed out here that it has been the medical practitioner rather than the members of the Army Medical Corps who has been to blame in this matter.

MEDICAL RESEARCH AND THE WAR

WE, in Canada, are apt to take the inhabitants of the little old British Isles, and more particularly the English, at their own valuation, and as it is the habit of the British to run themselves down, and of their press to deplore the want of energy of the inhabitants of the said isles, so are we apt to picture Great Britain as deplorably behind the times, and until a few weeks ago, when the "Tanks" woke an astonished world to British resourcefulness and ingenuity, not all the feats quietly and effectively performed by the British navy, or the wonderful fight put up by the "contemptible" little Army could quite remove from the Canadian mind that the Old Country was woefully behind the times.

But without advertising itself, that British Army Medical Corps has accomplished wonders, and one of those wonders it is, quietly performed, that deserves

more recognition than has hitherto been accorded. In civil life we of the profession are accustomed to weigh and estimate a medical institution or community, not by the fees it secures or the number of operations successfully performed, but by the extent of its contributions to medical advance. Judged thus, the hospital that is not attached to a medical school occupies a position inferior to one that is so attached, and the institution or school that merely teaches is regarded as inferior to one which possesses live laboratories conducting researches. It is true that the care of the patient and his treatment is the first object to be kept in mind in every medical institution, but experience has abundantly demonstrated that the greatest care and the best results are achieved where men are most alive to the problems of disease, and most keen to accomplish the solution of the same. The same principle holds true in connexion with the Army Medical Service.

It will be remembered that when the Old Country some few years ago was basking in what appeared to be universal peace, that most active Radical, Lloyd George, sprang upon the medical profession his Insurance Act, to the profound indignation of the greater part of the profession, who suddenly without even "by your leave" found themselves converted into panel doctors and civil servants. As a placebo Lloyd George introduced into his Act a section which placed a portion of the insurance monies at the disposal of the profession for purposes of research. The sum allotted annually was more then $250,000 and the researches, it was directed, were to be more particularly into those conditions which are most liable to affect the bulk of the people. Tuberculosis, for example; rheumatoid states, exanthemata, occupational diseases, etc. Sir J. Clifford Albutt, Sir William Osler, Sir Almroth Wright, Professor Sterling and other leaders in medical research were nominated upon a Medical Research Committee, and endeavours were made to establish a central research institute. Further, special investigations were subsidized in the different universities and other medical centres.

The scheme had been in operation scarce a year when the War broke out; then patriotically and with foresight, the Research Committee decided that for the duration of the War its income should be devoted to carrying on investigations and work in connexion with diseases amongst the troops.

The result has been very striking. No serious problem presents itself but forthwith the Research Committee gives assistance towards the solution of that problem, in this working hand in hand with the D.G.A.M.S., Sir Alfred Keogh. When, for example, cerebro-spinal fever started to become epidemic amongst the troops in Great Britain the Committee gave grants to bacteriologists in various centres to make thorough investigations. In their researches upon the proper treatment of wounds, both Lorrain Smith and his associates in Edinburgh, and Dakin working with Carrel in France, were working under the auspices of the Research Committee, as also has been Sir Almroth Wright's laboratory in France. The work of the late Professor Brodie in association with Professor J. J. Mackenzie upon the analysis of the respiratory gases in cases of chest wounds was supported by a grant from the same Committee, who have shown their willingness to support investigations by Canadians and capable men from all parts of the Empire.

The report of this Committee, published a few months ago, of the work accomplished during the year 1915, is a most striking document as indicating the wide scope of investigations conducted, thanks to the help furnished from this insurance fund.

Nor does this include all its activities. The War Office has placed in the hands of the Committee the compilation of the casualty statistics of the War, and a large staff is now engaged in the British Museum under one of the foremost statisticians in Europe—Dr. Brownlee—collecting these statistics, not merely of the British troops only, but of the Expeditionary Forces from all the Dominions, and that at a cost now that exceeds $100,000 a year.

Add to this that apart from the work of the Research Committee, many of the leading pathologists and bacteriologists of the Empire are in charge of the laboratories of the different Base Hospitals overseas, and in addition to performing the enormous amount of routine work the best of these men find time to undertake researches of the first order. The majority of these are published in the journal of the Royal Army Medical Corps. That journal alone affords proof that the work now being done in the mobile laboratories, and the laboratories of the Base Hospitals and of the Royal Army Medical College, Millbank, is of the very first order. The results obtained in more exact diagnosis, and improved treatment, places the British Army Medical Service in a position in which it is not excelled by any other Army Medical Service in the field.

INFANTILE PARALYSIS

THE epidemic of anterior poliomyelitis which appeared in Montreal during the second week of October, whilst it fortunately did not attain to large proportions numerically, presented some interesting features. Coming at a time when there was, so far as one can glean from reports, hardly more than the usual number of sporadic cases, it seemed suddenly to reach its maximum. A poll taken at a meeting of the Montreal Medico-Chirurgical Society on October 20th showed that the members present had seen sixty cases of the disease in the period of two weeks previous to the meeting, and by far the greater part of these were from that portion of the city where the best hygienic and social conditions prevail. As many of the recognized cases were fatal and as wide publicity was given to the fact by the daily press, the public became thoroughly alarmed and readily adopted all suggestions regarding prevention. Sunday schools, public and private schools, and all children's gatherings were discontinued in the section of the city principally affected, with the result

that by the first of November the number of cases reported had dropped to about the normal.

While there is so wide a disparity in the opinion of competent physicians regarding the etiology and mode of transmission of this disease, it will be wise to accept, for the present and until the matter has been further elucidated, the statement issued by the American Public Health Association as authoritative. At the meeting, held at Cincinnatti in October, a committee composed of Dr. Haven Emerson, Commissioner of Health, New York City, Assistant Surgeon Wade Frost, United States Public Health Service, and Dr. A. J. Chesley, Epidemiologist, Minnesota State Board of Health, drew up a report which was accepted by the Association as an authoritative expression of their opinion. Briefly stated, the finding of the committee is as follows: The specific cause of infantile paralysis is a microörganism which has not yet been positively identified. It is present in the nervous tissues, and also in the nose, mouth, and bowel discharges of persons suffering from the disease, and healthy associates of such persons may harbour the virus in their noses and throats and thus act as carriers of infection. The incubation period has not been definitely established, but is less than two weeks and in the great majority of cases between three and eight days. Effective preventive measures, approaching complete control, are impracticable, because isolation of recognized cases of the disease and restraint upon their immediate associates must fail to prevent the spread of infection by unrecognized cases and carriers. Of first importance is the more general recognition of the non-paralytic cases through clinical observation and laboratory procedures, and in this connexion lumbar puncture is recommended as offering valuable aid in diagnosis, and also in affording symptomatic relief as a therapeutic procedure. The measures recommended for controlling the disease are practically the same as those adopted in scarlet fever; namely, reporting all suspected cases; isolation of patients for six weeks; disinfec-

tion of all body discharges; restriction of the movements of intimate associates of the patient; protection of the children so far as possible from contact with other children or with the general public during epidemics; and observation of contacts for two weeks after last exposure.

An extremely interesting feature of the Montreal epidemic and one that has been noted in other cities, was the rapid appearance over a wide area of severe and fatal cases of the disease in which it was impossible to trace the source of infection unless through some common carrier such as food. It is difficult to provide an adequate explanation of such a phenomenon, but it is quite possible that the earlier cases in a community are of the milder and non-paralytic type, and as such go unrecognized, and when the severe and easily diagnosed cases appear, the infection has become widespread. Clinically, the epidemic type of poliomyelitis is very unlike the sporadic type. The latter is rarely fatal and when death does occur it is due to paralysis of the respiratory muscles, much as in death from post-diphtheritic paralysis. In the epidemic type, on the other hand, quite a proportion of the fatal cases succumb before the appearance of the paralysis from hyperpyrexia associated with a general toxæmia. So, too, the more unusual types of the disease, such as the encephalic, meningitic and bulbar forms, seem to provide a much larger proportion of the cases during an epidemic. It is to be hoped that the immense amount of study that has been possible on account of the proportions of the present North American epidemic will result in a more thorough knowledge of the disease and in the devising of means for controlling it.

The question of expert medical evidence was brought up by Dr. Wilfrid Derome in an address before the Montreal Chamber of Commerce. This matter was discussed in the January, 1913, number of the Journal, page 49, when some of the objections to the present arrangement were mentioned and recommendation was made of the appointment of physi-

cians as "experts", who in medico-legal cases would investigate the medical aspects of the case and submit an impartial report to the judge before the trial, thus avoiding the conflicting reports so often made under the present system by physicians engaged by the two parties concerned. At the close of Dr. Derome's address, the Chamber of Commerce decided to bring the matter to the notice of the Provincial Legislature.

The present cost of milk in Toronto was discussed at the annual meeting of the Tax Reduction Association, when an address was delivered by Dr. J. B. Fraser in which he drew a comparison between the germ and the bio-chemical theory of the causation of disease. Dr. Fraser stated that in Toronto, where it is illegal to sell other than pasteurized milk, the mortality among children is 29 per cent. higher than in London, England, where unpasteurized milk is sold. He thought that people should be allowed to purchase the latter if they wished to do so. In the discussion which followed Dr. Fraser's address, reference was made to the cost of delivering milk. It was thought the cost of milk might be reduced if dairies were owned by the municipality, as much overlapping in its delivery could then be avoided. A resolution was passed requesting the Board of Health to modify the present by-laws to permit of the sale of "raw" or unpasteurized milk.

The addition to the Naval Hospital at Chatham, England, given by the women of Canada was opened by His Royal Highness the Duke of Connaught on November 24th. It will be remembered that soon after the outbreak of war the sum of fifty thousand dollars was offered to the Admiralty by Canadian women through Her Royal Highness the Duchess of Connaught, for the purpose of providing a hospital ship. The Admiralty, however, considered that the money could be employed to better advantage in providing additional accom-

modation at the Haslar Hospital. Since then the fund has increased to forty thousand pounds which has been spent upon a new wing at the Chatham hospital. The Canadian Coat-of-Arms is emblazoned upon the outside of the building, and underneath it one reads the following inscription: "In love and loyalty to our King and Empire and undying gratitude to the brave men who are fighting in vindication of our honour."

The recognition of the fact that a large number of soldiers have been recruited in Canada who, upon arrival in England, have been found unfit for service, has led to a change in the regulations governing the medical examination of recruits. In future each man, after being passed by a medical officer, will be sent to a mobilization centre where he will undergo a second examination by a board of three practitioners. Whether accepted or rejected by this board, he will be paid for the time spent in undergoing the examination and travelling to and from the centre of examination.

A conference of representatives of the Ontario Government, the Military Hospitals Commission, and the Soldiers' Aid Commission took place at Toronto on November 7th, when the question of providing accommodation for tuberculous soldiers was considered. Representatives of municipalities were also present on this occasion. Arrangements have been made to provide accommodation for one hundred and thirty tuberculous soldiers at Hamilton, partly in the new building erected by the Health Association, which is nearing completion, and partly in other buildings which are to be put up by the Government on the Association grounds. It is the intention also to put up a building which will be devoted to vocational training. When the new buildings are no longer required for the treatment of soldiers, they will be given over to the Health Association. A grant of $25,000 has been made by the City Council of London, Ontario, towards the cost of

a permanent hospital for soldiers suffering from tuberculosis. The Ontario Government and the Military Hospitals Commission have also each contributed $25,000 to this hospital. The sanatorium at Freeport has also been handed over to the Hospitals Commission by the Kitchener City Council for a period of one year.

Arrangements have been made with the Intercolonial and Canadian Pacific Railways for the provision of hospital trains to bring wounded soldiers from Halifax, upon their arrival from England, to Montreal, Toronto, Winnipeg and Vancouver. The trains are being built on the same plans as the British military hospital trains, but of course adapted to the larger Canadian cars. They will be marked with the Red Cross on the outside and fitted with hospital beds, surgeries, and accommodation for doctors and nurses. There are in England at the present time about twenty thousand wounded Canadians and it is expected that about two hundred and fifty will leave for Canada each week. The provision of accommodation and treatment for these men is in the hands of the Military Hospitals Commission and under the immediate direction of Lieutenant-Colonel Alfred Thompson, M.P., chief medical officer of the Commission. Several buildings have been converted already into hospitals. The new asylum at Whitby has been taken over temporarily by the Commission and accommodation has thus been provided for six hundred patients, which when all the buildings are finished will be doubled. The Strathcona Hospital at Edmonton has also been taken over by the Commission and provides accommodation for one hundred and fifty patients. In Montreal the old Loyola College building is being equipped to take in from two hundred to two hundred and fifty soldiers and further room has been secured at the Grey Nunnery.

Canadian Medical Association

THE MEETING IN JUNE IN MONTREAL

The Executive Council of the Canadian Medical Association has decided that for many reasons an effort should be made next year to resume the annual meetings and has asked the profession in Montreal to take charge of the arrangements.

The last meeting took place in 1914 and was held in St. John. The meeting for 1915 was to have been held in Vancouver under the presidency of Dr. McKechnie, but under the stress of war conditions at the time, the Executive thought it wiser that no meeting should be held that year. This year also has been allowed to pass without any general gathering, but at a meeting held at the end of last month it was the general opinion that an effort should be made and that the Association should meet again in June of next year.

The War clouds still hang heavily over all. Many of our confrères are at the front doing heroic work. Those of us at home have many added burdens; nevertheless, all will, we are sure, respond loyally to the call of duty. We all recognize the valuable work being done by the American Medical Association in uniting in a common bond the members of the profession in the various states of the Union. Our Canadian Medical Association has a similarly high ideal. The profession in Montreal will do everything in its power to arrange an excellent and interesting programme, but solicit the assistance of members from all parts of the country in making the meeting a success. The date of meeting has been fixed for the 13th, 14th and 15th of June.

We hope as many members of our profession as possible will arrange to be present and will signify their intention of doing so early so that comfortable arrangements for their accommodation can be made. We will also be glad if members will transmit to the General Secretary, in Montreal, at as early a date as possible, the title of any paper they may desire to present.

A. D. Blackader,
President.

Miscellany

Book Reviews

TREATISE ON FRACTURES. By JOHN B. ROBERTS, A.M., M.D., F.A.C.S., professor of surgery in the Philadelphia Polyclinic and College for graduates in medicine; and JAMES A. KELLY, A.M., M.D., attending surgeon to St. Joseph's, St. Mary's, and St. Timothy's hospitals. 677 pages with 909 illustrations, radiographs, drawings and photographs. Philadelphia and London: J. B. Lippincott Company, 1916.

Anyone who knows Dr. John B. Roberts knows that whatever he does he does well, carefully and conscientiously. A perusal of the pages of the Treatise on Fractures by Roberts and Kelly enhances the above estimate. Each fracture is most clearly described and illustrated. And not only what may be called normal fractures, but the complications and more frequently associated injuries.

The drawings, radiograms, photographs and illustrations of apparatus are exceedingly clear. We can promise for this volume a generous reception by the profession and by medical students.

A TEXT-BOOK OF FRACTURES AND DISLOCATIONS, WITH SPECIAL REFERENCE TO THEIR PATHOLOGY, DIAGNOSIS AND TREATMENT. By KELLOGG SPEED, S.B., M.D., F.A.C.S., associate in surgery, Northwestern University Medical School. 888 pages, with 656 engravings. Publishers: Lea & Febiger, Philadelphia and New, York, 1916. Price $6.00 net.

Text-books devoted exclusively to fractures or to fractures and dislocations emphasize not only the importance of the subject but the advances made during the past decade. The author rightly devotes a good deal of space to the pathology of fractures and of bone repair, a basic knowledge of which is necessary for diagnosis, prognosis and treatment. The different fractures and dislocations are explained in clear language, and the illustrations are numerous, clear and illuminating. The principles of treatment are sound and the details of carrying out the principle are lucidly expressed.

Literature is freely drawn upon. It is noteworthy that Whitman's ideas and methods of treating fracture of the neck of the femur do not receive very special attention from the author.

Nail extension receives favourable comment although the dangers of infection are mentioned.

The open treatment of fractures is discussed in a judicial and conservative tone.

The volume has evidently been prepared with great care and it is to be commended.

Obituary

Dr. John Mackenzie, of Mulgrave, Nova Scotia, died October 29th. Born of Scottish parentage in the year 1860 at Boulardarie, Cape Breton, Dr. Mackenzie obtained his medical degree at Dalhousie University in 1884 and shortly afterwards began to practise at Mulgrave. His untiring devotion in the performance of his professional duties made him beloved and respected throughout the district.

Dr. F. Whybra died at Prince Albert, Saskatchewan, on October 30th, in the forty-sixth year of his age. Dr. Whybra was born at Niagara Falls and practised for some years at Stevensville, Ontario.

Dr. James Henry died October 30th at Orangeville, Ontario, where he had been in practice for fifty-three years. Dr. Henry was in the seventy-fourth year of his age. He was the son of the late Dr. Thomas Henry and was born at Sandhill, Ontario. He graduated from the University of Toronto in 1863 and at once went into practice at Orangeville. Dr. Henry was a member of the Ontario Medical Council for twenty-five years and for some time was surgeon to the 36th Regiment, retiring with the military rank of Lieutenant-Colonel. He was coroner for the counties of Dufferin, Grey, Peel, and Wellington and upon five occasions was elected mayor of Orangeville.

Dr. Thomas Masson, of Cape Vincent, New York, died October 26th. Dr. Masson was born at Seymour, Northumberland

County, Ontario, in 1851, and graduated from Queen's University in 1871. He had been in practice at Cape Vincent since 1875.

Dr. J. J. Mullin died at Montreal on September 28th, in the thirty-ninth year of his age. Dr. Mullin graduated from McGill University in 1906 and was in practice at Victoria for a few years, but the state of his health obliged him to give up professional work.

Dr. J. W. McMeekin, who died at Saginaw, Michigan, was born in 1859 and graduated from McGill University in 1885. He had been in practice at Saginaw for some years.

Dr. Charles Peter Bissett died at Arichat, Nova Scotia, on November 19th. He was born at River Bourgeois in June, 1866, and was the ninth son of George H. Bissett, who is still living at the age of ninety. Dr. Bissett graduated as gold medallist from McGill University in 1890. He practised at St. Peters, Nova Scotia, and for eleven years was representative of the Liberal party of Richmond County in the provincial House of Assembly.

Dr Thomas P McDonald, whose death recently occurred in South Africa, was in the forty-eighth year of his age. He was born in Ontario and graduated from the University of Pennsylvania in 1891. After doing some postgraduate work in England, he returned to Canada and practised for a time at Barrie. From there he went to San Francisco and later returned to England, taking up a practice at Peel in the Isle of Man. He was unable to stay there, however, on account of his health and went to South Africa in the hope that the change of climate might restore him.

Dr. Alexander Beith died suddenly on November 10th at Bowmanville, Ontario, where he had been in practice since 1866. He was born in Darlington Township, Ontario, on December 10th, 1840, of Scotch parentage, and took his medical degree at Toronto University. During the sixty years of his professional work in Bowmanville, he had won the respect of the whole community and his death is greatly regretted.

Dr. Marshall Sutton, of Cooksville, Ontario, died suddenly November 23rd, in the sixty-sixth year of his age. Dr. Sutton was born at Clandeboye, Ontario. He attended the Guelph High School and then taught for a time before entering the medical faculty of the

University of Toronto, where he received his degree in 1877. He afterwards did some postgraduate work in London and Edinburgh. He resided for a time in North Dakota and had been in practice in Cooksville for the past twenty-three years.

Dr. Francis L. Howland, of Huntsville, Ontario, died November 8th. Dr. Howland was born at Whitby, Ontario, and graduated in medicine with honours from McGill University in 1867. He practised for a short time at Woodstock and in 1875 went to Huntsville, which was then only a small village. In addition to his professional work, Dr. Howland became the editor of *The Liberal*, which later became known as *The Forester*. He also took an active part in politics. About fifteen years ago he established the Huntsville General Hospital, an institution which was closed a few years ago when the Government grant was withdrawn.

News

MARITIME PROVINCES

The sum of $5,000 has been offered by Mr. C. C. Blackader, proprietor of the *Acadian Recorder*, towards a fund for the erection of a hospital in Halifax for the treatment of advanced cases of tuberculosis.

ONTARIO

The annual meeting of the Ontario Medical Association will take place at Toronto from May 31st to June 2nd, next.

The twenty-first annual meeting of the Kitchener-Waterloo General Hospital was held on October 16th. It was reported that during the year under consideration 935 patients had been admitted to the institution and 940 had been discharged, and that 60 deaths and 71 births had occurred.

The report for the year ending September 30th, 1916, presented to the directors of the Protestant General Hospital, Ottawa, shows that the cost of maintenance has increased by $8,000 during the year, due partly to the advanced price of medical supplies. The number of patients treated was 2,944 including a number of soldiers. Forty-six thousand days of treatment were given.

A DENTAL clinic has been established in connexion with the public schools of Hamilton.

CAPTAIN MURRAY PATERSON, C.A.M.C., of Chatham, Ontario, was the guest of honour at a banquet given by the Canadian Club on the occasion of his return to the front after a month's furlough. Captain Paterson has been recuperating from the effect of wounds which he received through going into "No Man's Land" to the rescue of a wounded comrade. His bravery on this occasion was rewarded by the Military Cross which was conferred upon him by His Majesty the King.

THE death of Mr. Leon Maguire recently occurred at the Wellesley Hospital, Toronto, from paratyphoid fever which, it is stated, was contracted through eating celery. Four other persons, who also partook of the celery, are seriously ill.

DR. R. E. DAVIS has been appointed medical officer of health of Shelburne in succession to Dr. J. A. Smith, who has resigned.

AT the twenty-second annual meeting of the Ottawa Maternity Hospital, it was reported that the wards had been filled throughout the year and that 576 patients had been admitted to the institution as compared with 527 during the previous twelve months. The number of births was 544. The death of patients admitted to the hospital occurred in four instances.

THE Toronto Orthopædic Hospital was reopened on November 16th. It has been enlarged and now has a capacity of forty beds.

APPLICATION is to be made to the Ontario Government for an increase in the grants to hospitals, on the ground that the amounts now received are inadequate in view of the high cost of maintenance and the amount of free treatment given to soldiers and their families.

THE Brantford Hospital has increased its charges to patients from outside districts from seventy cents to one dollar a day.

QUEBEC

THE following information is taken from the report of the Bureau of Statistics of the Province of Quebec for the year 1915. There are in the province five hospitals for the insane, the admissions

to which during the year numbered 1,236—rather less than during the previous year, when 1,325 admissions were made. On December 31st, 1915, there were 5,074 patients in the asylums of the province. The patients admitted to the forty-nine hospitals and six sanatoria in the province numbered 41,755, an increase over the 30,396 admitted during the previous year. The prisoners admitted to the various penitentiaries, of which there are twenty-seven, numbered 9,030 as compared with 11,328 in 1914. Four hundred and seventy-two juvenile delinquents were sent to corrective institutions and 2,132 admissions were made to industrial schools. In 1914, the juvenile delinquents admitted to institutions were to the number of 438, and the admissions to industrial schools 1,340.

A REPORT has been submitted to the provincial government by the Superintendent of the Protestant Hospital for the Insane, Verdun, in which the need for more accommodation at the hospital is pointed out. At present there are 761 patients in the institution, which is sixty more than the building is intended to accommodate.

MANITOBA

A MEETING of the provincial board of health took place on November 16th, when it was decided that all dairies in the province of two or more cows should be licensed and inspected regularly; that the use of hydrocyanic acid as a verminicide should be prohibited, as several deaths have occurred in the province as a result of the use of this acid; and that the common drinking cup and roller towel should be abolished. It was decided to recommend that the use of basements as residences or for manufacturing purposes, except under very stringent conditions, should be made illegal. It was recommended also that the staff of public health nurses be increased, and approval was expressed of the inspection of dairies, creameries, cheese factories, slaughter houses, butcher shops, meat and milk supply. It was resolved that more active measures be taken to prevent infant mortality, especially in the frontier settlements, and that further steps be taken to educate the people by means of lectures and addresses. The question of the sanitary inspection of hotels, lodging houses boarding houses and restaurants will be considered at a special meeting to be called in the near future.

BRITISH COLUMBIA

The cornerstone of the new Kootenay Lake General Hospital was laid on October 21st by Mr. William Astley of Vancouver. When completed the new building will contain accommodation for sixty-four patients.

Dr. Edward Hasell, who recently retired from the office of medical superintendent of the Provincial Royal Jubilee Hospital, Victoria, has been appointed medical superintendent of military hospitals in District No. 11.

MEDICAL COLLEGES

Toronto University

Lieutenant Gordon Wilson Crow, whose death occurred in action on September 22nd, was a student in the medical faculty of the University. He had distinguished himself for bravery on more than one occasion and had won the Military Cross at the battle of Ypres on June 2nd and 3rd.

Queen's University

The summer session given by the medical faculty of Queen's University has enabled the following students, fifty-six in number, to complete their medical studies and to obtain their degree. Most of these graduates will offer themselves at once for overseas service with the Canadian or the Royal Army Medical Corps.

Degree of M.B.: L. N. Armstrong, Kingston; H. M. Barnes, B.A., Gananoque; W. J. D. Black, Kingston; O. K. Blackett, Port of Spain, Trinidad, B.W.I.; J. P. Bonfield, Ottawa; H. A. Boyce, Harrowsmith; Bruce Cannon, B.A., Kingston; J. M. Clark, Scugog; G. H. T. Clarke, Manzanilla, Trinidad, B.W.I.; C. B. Corbett, Ottawa; R. F. Davidson, Toronto; J. R. Davies, Vancouver, B.C.; W. P. Downes, B.A., Hamilton; J. H. Fraser, B.A.; Dalkeith; C. D. Gallagher, Kingston; Chilvers Gooch, Brooking, Sask.; E. J. Gordon, Highgate; Harry Hedden, Dunnville; R. K. Johnstone, Inverary; A. L. Leatherbarrow, Hampton Station, N.B.; W. H. Lloyd, Kingston; Benjamin Lyon, Kingston; J. O. MacDonald, B.Sc., Strathroy; P. M. MacDonell, M.A., Kingston; H. G. MacFarlane, Ridgetown; E. C. Mick, Powassan; G. F. McFadden, B.A.; Sudbury; B. T. McGhie, Kingston; A. G. McGhie, Kingston; W. W. McKay, Pembroke; H. R. Nicklin, Newton; E. W. Nolan,

Toronto; F. A. O'Reilly, Wolfe Island; C. A. Palmer, St. Ann's Bay, Jamaica, B.W.I.; J. R. Patterson, Peterboro'; J. E. Power, Duluth, Minn.; F. L. Reid, Kingston; W. G. Robertson, Renfrew; J. P. Sweeney, Charlottetown, P.E.I.; A. J. Tripp, Fitzroy Harbor; R. J. Tucker, Paisley; J. B. Willoughby, Llyndhurst; J. A. Young, B.A., Griswold, Man.

Degree of M.D., C.M.: E. J. Brennan, M.B., North Bay; T. F. Cartar, M.B., San Fernando, Trinidad, B.W.I.; W. T. Case, M.B., Georgetown, British Guiana; E. C. A. Crawford, Melville, Sask.; G. F. Denyes, Odessa; D. R. Fletcher, Ceylon; W. R. Grant, M.B., Sintaluta, Sask.; G. H. Johnston, B.A., Cataraqui; J. E. Kane, M. B., Kingston; J. A. Labelle, M.B., Ottawa; G. F. Laughlin, Point Anne; H. M. MacDonald, M.B., Owen Sound; D. K. F. Mundell, Kingston; W. C. Page, B.A., Kingston; G. S. Purvis, Viking, Alta.; C. M. Sellery, B.A., Cobourg; K. M. Shorey, Napanee; G. F. Sills, Tweed; L. D. Stevenson, B.A., Dunfermline, Scotland; A. B. Whytock, B.A., Madoc.

Medal in Medicine: Henry Hedden, Dunnville; A. B. Whytock, Madoc.

Medal in Surgery: K. M. Shorey, Napanee.

ARMY MEDICAL SERVICES

Lieutenant-Colonel F. G. Finley, C.A.M.C., of Montreal, has been appointed consulting physician to the Canadian hospitals in England. Lieutenant-Colonel Finley went overseas with the first Canadian Division as chief medical officer of No. 1 Canadian General Hospital.

The Silver Medal of La Société de Secours aux Blessés Militaires (French Red Cross) has been awarded to Dr. Charles Valery of Edmonton, who is now in charge of a military hospital in Paris. Dr. Valery received the French War Cross some time ago for conspicuous bravery under enemy fire.

The Distinguished Service Order has been conferred upon Lieutenant-Colonel Harry Melville Jacques, C.A.M.C., who "supervised the clearing of the front and controlled the work of the advance and main dressing station with great skill and personal courage." Lieutenant-Colonel Jacques graduated from McGill University in 1894 and before enlisting with the Canadian Army Medical Corps was in practice in Halifax.

The Military Cross has been conferred upon the following Canadians: Captain H. H. Argue, C.A.M.C., of Toronto, "who attended and dressed the wounded under heavy fire, displaying great courage and determination." Captain Argue was assistant superintendent of the Toronto General Hospital and received his commission in the Canadian Army Medical Corps on April 26th, 1915. Captain Felton, C.A.M.C., of Snooke, British Columbia. Captain William Brown, C.A.M.C., who "attended and dressed the wounded for forty-eight hours under heavy fire, displaying great courage and determination." Captain A. H. Taylor, C.A.M.C., medical officer of the 24th Battalion, Victoria Rifles, and son of Dr. Taylor of Goderich, Ontario. In reference to Captain Taylor, Colonel Gunn, commanding officer of the battalion, writes: "During a bitter engagement a lieutenant of the battalion had his leg shot away and was unable to be moved. Captain Taylor, alone, left his station and in the face of a heavy barrage fire went out and dressed the wound, enabling the wounded officer to be brought in." Captain Taylor graduated from the University of Toronto in 1910 and before enlistment was medical superintendent of the Calgary General Hospital.

The Military Cross has also been awarded for conspicuous bravery to Captain John R. Christian, R.A.M.C., of Edmonton, and to Captain Clarence Young, R.A.M.C. Captain Young is the son of Mr. William Young, of Guelph, Ontario, and is twenty-seven years of age. He was surgeon to the western section of the Grand Trunk Pacific Railway and joined the R.A.M.C. last spring. His brother, Captain Ernest Young, C.A.M.C., is on the staff of the Western University Military Hospital

The Military Medal has been awarded to Captain George Miles, C.A.M.C., of Toronto. Captain Miles has been on active service since the commencement of the war. Another recipient of the Military Medal is Sergeant Horace May Gillmor, C.A.M.C. Sergeant Gillmor was studying medicine at McGill University when he joined the 6th Field Ambulance in the Spring of 1915. He is a son of Senator Gillmor, of Westmount, Montreal.

Dr. Gordon G. Malcolm, of Lac de Bonnet, Manitoba, has joined the staff of a field ambulance for overseas service. Dr. Malcolm is a graduate of the University of Toronto.

Captain D. J. MacKay, C.A.M.C., who recently returned from England, has been appointed medical officer of the 118th Waterloo Battalion. Captain Austin D. Irvine, C.A.M.C., of Montreal, has been appointed medical officer of the 245th Overseas Battalion, Canadian Grenadier Guards. Dr. Irvine graduated from McGill University in 1896. Captain L. T. Ainley, C.A.M.C., is the medical officer of the 222nd Battalion.

The following have joined the Canadian Army Medical Corps: Dr. McCue, of Walkerton, Ontario; Dr. L. V. Turrill, of Outlook, Saskatchewan.

Dr. J. S. Matheson, of Brandon, Manitoba, has left for overseas service.

The direction of recruiting amongst the French Canadians in all parts of the Dominion has been placed in the hands of Colonel Arthur Mignault, C.A.M.C., of Montreal, who recently returned from France.

Lieutenant-Colonel C. W. Rowley of the Military Hospitals Commission has been made an Esquire of the Order of the Hospital of St. John of Jerusalem.

The following promotions in the Canadian Army Medical Corps have been gazetted: To be Majors: Captains S. M. Polson, Garfield Platt, and W. H. Ballantyne, of Queen's Military Hospital.

The following Lieutenants in the Canadian Army Medical Corps have been gazetted temporary Lieutenants in the Royal Army Medical Corps: B. O. Kinney, G. L. Gall, M.D.; C. M. Anderson, M.D.; F. G. Pedley, M.D.; W. C. Brown, M.A.; Harrington, M.B.; J. W. McKie, M.B.; F. J. Colling, M.B.

Captain Gordon Gunn, R.A.M.C., of Edmonton, has been recommended for distinction for conspicuous bravery on the field of action.

Captain A. K. Haywood, C.A.M.C., who accompanied the First Canadian Contingent as medical officer of the 3rd Battalion

(Toronto) has been given the command of a convalescent hospital in England.

Lieutenant-Colonel McKenzie Forbes, C.A.M.C., has been appointed medical officer of the Montreal and Quebec district by the Military Hospitals Commission.

The following have been appointed medical officers of overseas battalions: Captain E. A. McCusker, C.A.M.C., of the 5th Canadian Pioneers Battalion; Captain Henry George, C.A.M.C., of Red Deer, Alberta, of the 191st Battalion; Captain L. T. Ainley, C.A.M.C., of Wadena, Saskatchewan, of the 222nd Battalion; Captain Austin D. Irvine, C.A.M.C., of the 245th Battalion, Gernadier Guards, Montreal.

Lieutenant G. A. Lyons, R.A.M.C., is the medical officer of the 25th Middlesex Regiment. Lieutenant Lyons graduated from McGill University last spring.

Doctor R. W. Clarke, of Bowmanville, Ontario, has been obliged to resign his position of medical officer of the 235th Battalion on account of his health and has resumed civil practice.

Doctor L. H. Roberts, of Freligsburg, Quebec, has received a commission in the Canadian Army Medical Corps.

Captain A. H. Caulfeild, A.C.M.C., of Gravenhurst, Ontario, who has been engaged in bacteriological work for the British Admiralty, is now directing the treatment of cases of typhoid fever and cerebro-spinal meningitis at the Shorncliffe Military Hospital.

A tablet to the memory of the late Captain Douglas Waterston C.A.M.C., was unveiled at the Melville Presbyterian Church, Westmount, Quebec, on November 19th. Captain Waterston met his death while succouring a wounded comrade on May 22nd, 1916, a few weeks after his arrival in Flanders with the 9th Field Ambulance. The memorial tablet has been placed in the Melville Church by Lieutenant-Colonel Peters, the officer commanding the unit, and other officers of the 9th Field Ambulance. Captain Waterston was buried in the British Cemetery at Reninghelst, Belgium.

Lieutenant-Colonel Thomas B. Richardson, who has been in command of the Toronto Military Base Hospital, has been appointed president of the Medical Board, Toronto, and temporary command of the Base Hospital has been given to Lieutenant-Colonel Cameron A. Warren, of Toronto. The laboratories of the hospital are under the direction of Captain George D. Porter.

Captain H. B. Paul has been appointed commanding officer of the new Canadian hospital at Otchingill, near Shorncliffe.

CASUALTIES

Killed in Action

Captain R. E. Horkins, R.A.M.C., whose death occurred in action on the Somme front, was the son of Mr. T. J. Horkins, of Campbellford, Ontario. He graduated from the University of Toronto in 1912 and became house surgeon at St. Michael's Hospital, Toronto. He joined the R.A.M.C. shortly after the outbreak of war and upon arrival in England was attached to the Royal Irish Fusiliers and later to the 75th Howitzer Brigade. He had been in the trenches for ten months when he met with his death. In Toronto Captain Horkins was well known as a Lacrosse and Rugby player.

Captain Francis Sharpe Walcott, C.A.M.C., who was killed in action on October 6th, last, took his medical degree at McGill University in 1915.

Accidental Death

The death of Major Herbert George Bowlby, C.A.M.C., occurred at Seaford, England. Major Bowlby was the A.D.M.S. of the Canadian medical forces in the Shoreham area and had been overseas for eighteen months. He was in practice at Kitchener, Ontario, and had twice been elected mayor of that city. His death was due to an accident, when he missed his footing and fell over the cliffs at Seaford.

Died

Captain W. A. Henderson, C.A.M.C., died suddenly at Sarnia Ontario, on October 25th. Captain Henderson returned from the front about a month before he died.

Wounded

Captain J. A. Callum, C.A.M.C., of Regina.
Captain P. Poisson, C.A.M.C.
Captain W. L. Hutton, C.A.M.C.

Canadian Literature

Original Contributions

The Canada Lancet, July, 1916:

Ontario Medical Association. Presidential address . . . . . H. B. Anderson.
Relative merits of the steel plate and of the autogenous bone graft, in the operative treatment of simple fractures . . . . . E. R. Secord.

The Western Medical News, July, 1916:

Cæsarean section . . . . . J. W. Turnbull.
A case of double female genitalia . . H. MacLean.
A note on dysenteric arthritis. . . T. G. Moorhead.

The Public Health Journal, July, 1916:

Alcohol from the public health standpoint. J. W. S. McCullough.
The attitude of the psychiatrist towards alcoholism as a cause of insanity . C. K. Clarke.
The Royal Institute of Public Health . A. Corbett Smith.
The mother in industry . . . . J. Martin.
Hygiene in Winnipeg in the early seventies E. Marston.

L'Union Médicale du Canada, July, 1916:

De l'expertise médicale et du choix des médecins experts dans la province de Québec . . . . . G. Villeneuve.

The Public Health Journal, August, 1916:

Tuberculosis in relation to feebleminded-ness	P. H. Bryce.
Poliomyelitis (Infantile paralysis)	W. H. Frost.
The care of children under school age	D. Forsyth.
Flies and refuse heaps	W. H. Symons.
The necessity for food inspection	G. R. Mines.

L'Union Médicale du Canada, August, 1916:

L'expertise psychiatrique en matière penale dans la province de Québec et plus particulièrement dans le district judiciaire de Montréal. Etude statistique	G. Villeneuve.
Les hépatites infectieuses et toxiques	E. P. Benoit.
La syphilis au point de vue médical	C. F. Gauthier.
La syphilis au point du vue social	R. Pepin.

La Clinique, August, 1916:

Traitement de la fièvre typhoide par la refrigération continue de l'abdomen	L. F. Dube.

The Canadian Journal of Medicine and Surgery, September, 1916:

The treatment of diabetes mellitus	E. P. Joslin.

Dominion Medical Monthly, September, 1916:

The treatment of diabetes mellitus	E. P. Joslin.

La Clinique, September, 1916:

La neurasthénie de la cinquantaine	A. Leclercq.

The Canadian Practitioner and Review, October, 1916:

Blood transfusion: The author's technique. Report of eighty-five transfusions	L. J. Unger.
Medical problems involved in the classification, treatment and final disposition of invalided soldiers	F. W. Marlow.

The Canada Lancet, October, 1916:

Chronic cystic mastitis	Dean Lewis.
Eclampsia	J. Fleming Goodchild.

Medical Societies

ALBERTA MEDICAL ASSOCIATION*

The eleventh annual meeting of the Alberta Medical Association took place in Edmonton, September 21st and 22nd. The local doctors almost without exception took an active interest in the meeting and the attendance from the province at large was very satisfactory considering the stress of these times and the distance many of the men had to travel. Thus, Calgary is two hundred miles from Edmonton, Medicine Hat is three hundred and eighty miles, Cardston is four hundred miles, and members came from these as well as other points, and some Alberta practitioners who practise five hundred miles apart shook hands at this meeting. There was a registration of seventy names and every session was well attended. A well-balanced programme of twenty-five papers had been arranged. All but two of these were presented and read, these two being on hand but crowded out by lack of time. Every paper and committee report was enlivened by ample, pertinent discussion. The variety and timeliness of the papers may be seen in the following list.

"Medical inspection of school children," Dr. J. D. Dunn, Medical Inspector of Schools, Edmonton; "Some observations on public health work," Dr. T. J. Norman, Provincial Medical Officer of Health; "Early diagnosis of mental deficiency," Dr. Fred W. Stockton, Calgary; "End results of various disabilities of returned soldiers," Captain E. Hobart Reed, M.D., Medical Officer of Ogden Convalescent Home; "Medical ethics and fees," Dr. C. W. Field, Registrar, College of Physicians and Surgeons of Alberta, Edmonton; "Cancer of the large intestine, pathology," Dr. D. G. Revell; "Diagnosis and treatment," Dr. E. W. Allin, Edmonton; "Dislocations of the spine," Dr. C. E. Smyth, Medicine Hat; "Certain abdominal lesions, with case reports," Dr. J. S. Wright, Edmonton; "Acidosis in surgery, with illustrative cases" (to appear in the "Annals of Surgery"), Dr. W. A. Lincoln, Calgary; "Personal experience in *x*-ray therapy," Dr. Geo. H. Malcolmson, Edmonton; "Blood pressure," Dr. T. B. Stevenson, Wetaskiwin; "Hay fever," Dr. F. W. Gershaw, Medicine Hat; "Medical treat-

*Editor's Note.—We are indebted to Dr. D. G. Revell, secretary-treasurer of the Alberta Medical Association, for this interesting report of the recent annual meeting. A shorter account was published in our last issue.

ment of obstetric cases," Dr. H. C. Swartzlander, Oyen; "Eclampsia," Dr. A. E. Archer, Lamont; "Internal secretions," Dr. J. B. Collip, Department of Physiology, University of Alberta; "Newer views of ventilation," Dr. Alex. Fisher, Superintendent of Calgary General Hospital; "Embolism of superior mesenteric artery," Dr. A. Forin, Edmonton; "Mouth infection as a source of systemic disease," Dr. B. A. Murray, Edmonton; "Treatment of squint" Dr. R. Bruce Wells, Edmonton; "Circumcision," Dr. F. J. Folinsbee, Edmonton; "Medical reciprocity," Dr. John Park, Edmonton; "Monsters of defect and of excess," Dr. D. G. Revell, Department of Anatomy, University of Alberta; "Urethral catheterization," Dr. E. L. Garner, Edmonton; "Acute anterior poliomyelitis in an adult," Dr. A. A. Nicholls, Edmonton.

An attractive and valuable feature of the meeting was a number of exhibits, comprising many *x*-ray photos by Dr. Geo. H. Malcolmson, Edmonton; operation specimens, with sections, of cancer of the large intestine, by Drs. Allin and Revell; and museum specimens, with *x*-ray plates, of monsters of excess and of defect, by the Department of Anatomy of the University.

Cases were also presented as follows: Four patients operated on for cancer of the large bowel, by Dr. Edgar Allin, Edmonton; Two cases of new-growth (sarcoma and epithelioma), undergoing treatment by *x*-ray with very marked improvement, by Dr. Geo. H. Malcolmson, Edmonton; Acute anterior poliomyelitis in an adult, by Dr. A. A. Nicholls, Edmonton; Branchial cyst, by Dr. F. J. Folinsbee, Edmonton; also a specimen of dermoid cyst, by Dr. F. A. Nordbye, Camrose; and of chronic endocarditis, by Dr. A. Forin, Edmonton.

His Honour, the Lieutenant Governor, Dr. R. G. Brett, the retiring president, opened the first session, and after a short appropriate speech, installed the president-elect, Dr. T. H. Whitelaw, Medical Officer of Health of Edmonton, in the chair. The treasurer's report showed a small balance after meeting all expenditures and liabilities.

As a result of papers read and the discussions which these evoked, resolutions were adopted which aimed to give practical results. Thus, one resolution provided for a committee of eleven to carry on a propaganda of mental hygiene and of public health, for which work a grant is asked for from the funds of the College of Physicians and Surgeons of Alberta; this resolution also calls on the Government to create a separate department of public health; another resolution requests the Medical Council of Alberta to take

the necessary steps to establish medical reciprocity between Alberta and the General Medical Council of Great Britain as soon as possible. Others provided for the adoption of a code of ethics—that of the American Medical Association; for a tariff of medical and surgical fees in Alberta as a means of assistance in cases coming into the law courts; and finally the views of the medical men and the facts regarding the hospital situation in this province were set forth as follows:

"1. That we the Alberta Medical Association approve of the efforts being made for the extension of hospital accommodation in this province, and will be glad to coöperate in any efforts to secure and improve hospital accommodation in rural districts.

"2. The need of hospital accommodation is at present most acute in the country districts and we urge the establishment of cottage hospitals throughout the rural municipalities, the management of such hospitals to be left in the hands of a committee and to be made as largely self-supporting as possible.

"3. We believe that the hospital accommodation of the cities of Alberta is at present adequate for the needs of the present population of the cities. We also believe that the present system of management and rules of admission and conduct of patients is the best suited to give the best service to the whole community. We believe that no one in the cities suffers for want of such treatment because of its cost. It is our experience that there is no difficulty in obtaining any form of hospital treatment free of charge if the circumstances warrant it.

"4. This Association wishes to protest against certain misrepresentations regarding the management and service of the hospitals of this province. We are in a position to know that the present hospitals are rendering an efficient and valuable service to all classes of people and merit the hearty support of the community they serve."

During the year past the Association has lost Dr. H. G. MacKid, of Calgary, a former president both of the Alberta and of the Canadian Medical Associations, whose death has already been noted in the JOURNAL; Captain H. S. Monkman, Vegreville, of the 3rd C.M.R., killed in action; also Lieutenant Chas. Wilson, son of Mrs. H. C. Wilson and the late Dr. H. C. Wilson, of Edmonton, was killed in action. A resolution was adopted extending condolence to their families.

The social part of the meeting was not allowed to encroach on the real business, but facilitated and supplemented the latter.

Luncheon was provided by the local members each day and was conveniently served in the spacious and handsome dining hall of the university; and the opportunity was also taken to inspect the university buildings and equipment, including the residences, laboratories and the new teaching building which is unsurpassed in its kind in Canada.

Upon the evening of the first day the session, presided over by His Honour, Dr. R. G. Brett, was open to friends of the members. There were addresses by the chairman, by President Tory of the University, by Dr. Dyde, Principal of Robertson College, and Dr. T. H. Whitelaw gave his presidential address. A fitting conclusion to the convention was the banquet, Friday evening, at the Hotel MacDonald, given by the members of the Edmonton Academy of Medicine to the visiting members, and to local members of the C.A.M.C. on active service.

It was decided to meet in Calgary next year and the following executive was elected: president, Dr. W. A. Lincoln, F.R.C.S., Eng., Calgary; first vice-president, Dr. E. Allin, Edmonton; second vice-president, Dr. Geo. E. Learmonth, High River; secretary-treasurer, Dr. D. G. Revell, Department of Anatomy, University of Alberta; councillors: Drs. J. S McEachern, Calgary; L. S. MacKid, Calgary; R. B. Francis, Calgary; J. S. Wright, Edmonton; and F. W. Gershaw, Medicine Hat.

ACADEMY OF MEDICINE, TORONTO

The stated meeting of the Academy of Medicine, Toronto, was held in the Mining Building of the University of Toronto on Tuesday, October 3rd, at 8:30 o'clock p.m. The guest of the evening was Professor A. J. Carlson, professor of physiology, University of Chicago, who addressed the Academy upon the subject: "Some recent contributions to the physiology and pathology of the stomach," illustrated by lantern slides.

Dr. Carlson did not feel himself a stranger in Toronto as he is associated with a number of Toronto graduates in the University of Chicago. Professor Carlson's experimental work on the stomach was made possible by finding a man who as a child had a stenosis of the œsophagus due to caustic potash and who had since been fed through a gastrostomy opening. A series of slides were shown demonstrating the muscular contractions of the empty stomach, secured by an inflated rubber balloon in the normal stomach and connected through a tube in the œsophagus to a tambour and trocar proper.

As digestion proceeds there is an increase in the vigour of the muscular contraction leading to an almost tonic condition. This develops with the emptying of the stomach and is synchronous with the sensation of hunger. There is no doubt but that the phenomenon of hunger is due to this increased "tonus" of the stomach and is not due to vagus or sympathetic control being present in the isolated stomach. It is present when the cerebrum is removed but not when the optic thalamus is destroyed.

Stimulation of the gastric mucosa relieves these contractions, swallowing saliva induced by chewing hard paraffin, for example, the swallowing of normal gastric juice, etc., while water has much less effect. Smoking a rather strong cigar was shown in one experiment to exhibit these "hunger" contractions. Massage of the abdomen acted similarly, as did the application of a tight belt.

The activity of nerve muscular mechanisms in general is lessened during sleep, while the contractions of the empty stomach are increased during sleep. All external stimuli so far investigated lessen these contractions, none increase them. All increase in contraction seems to come from the gastric mucosa itself as reflex through the optic thalamus. Hæmorrhage increases the hunger contractions as demonstrated by rapid withdrawal of blood from the carotid of a dog.

Cases showing clinically bulimia, polyphragia, when investigated, showed hypotonic contractions of the stomach, i.e., excessive "hunger" contraction. Pyloric stenosis induces hypotonic contractions.

In some experimental work on gastric and duodenal ulcer induced in laboratory animals the result showed that those in contact with normal acid gastric secretion healed with the same rapidity as those not so exposed, and quite as rapidly as those in the duodenum quite cut off from acid secretion and exposed only to the alkaline secretions found there.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The seventeenth regular meeting of the society was held Friday, June 2nd, 1916, Dr. F. A. L. Lockhart, President, in the Chair.

Pathological Specimens: Series by Dr. J. W. Scott.

Dr. Scott exhibited a series of specimens of carcinoma of the penis which had been submitted to the Pathological Department of the General Hospital during the past fifteen months. The series

included four specimens and were of interest, first, because carcinoma of the penis is so rare, representing only about two per cent. of all cases; second, because each case illustrated a different etiological factor of importance, and third, the specimens showed the disease in the usual different situations—two of the prepuce, one of the glans and one into the urethral portion, this being the rarest form.

The first case is a clipping sent in by a physician outside the city. The patient, aged fifty-three, had noticed progressive thickening and induration of the penis for some time; he had an indurated, thick, ulcerating sore with a foul discharge. He applied to his physician for circumcision but suspecting malignancy a clipping was sent to the Pathological Department. It proved to be carcinoma but the patient refused operation.

The second case was a man aged forty, who had his penis crushed while lifting shelves. He was treated four or five days after the accident by moist dressings and did not return to hospital for two or three months when an area of induration was noticed. He again left after local treatment but returned five months later with the growth very much extended. He was operated on but it is too recent to say anything about recurrence.

The third specimen illustrates the condition attacking the beginning of the urethra. The patient, aged forty-nine, had stricture, and two years previously noticed a swelling in the situation of the urethra. It began to grow actively and two months later there was a sanguinous discharge. No history of syphilis. The specimen was sent in for diagnosis and one can easily recognize the condition of the growth; the tissue is friable, indurated, and the architecture of the entire urethra has been destroyed by the growth.

The fourth specimen is one of early carcinoma. The patient, aged sixty-six, had a history of chancre twenty-five years ago at site of present ulcer, which embraced the urinary meatus. It had been cauterized and healed nicely with some scarification. Twelve months ago softening of the scarification occurred and progressively enlarged; at operation the induration was about the size of a ten-cent piece. Previously a snipping sent in for examination proved it to be cancer.

The last specimen is that of a lung from a patient who died from pulmonary hæmoptosis and tuberculosis, recognized as a rare condition. The patient was a female, aged fifty-four; history negative, no night sweats, no cough, lost twenty-five pounds in six months; no gastro-intestinal disturbance. Three days ago spat up a pint of blood, remained quiet for twelve hours then returned two

days later, having early in the morning coughed up one and a half pints of blood; twenty-four hours later died after another excessive hæmorrhage. At autopsy the trachea, stomach and bronchi were full of blood, the mucous membrane of the stomach was simply blood stained with no evidence of ulceration. Both lungs were quite extensively involved with a tuberculous process and we were able to confirm the diagnosis of cavitation of the left apex, the cavity being about the size of a golf ball, quite smooth, and contained recent blood. By injecting one of the vessels leading to the upper lobe one could demonstrate easily the site of the hæmorrhage. The only other evidence of tuberculosis found was an acute tuberculous enteritis involving the lower part of the ileum.

Discussion: Dr. M. Lauterman: This excellent series of specimens of carcinoma of the penis which Dr. Scott has been good enough to bring before us is one of the most interesting I have seen. Dr. Scott has very rightly said that carcinoma of the penis represented about two per cent. of all cases of carcinoma. In these cases the outstanding feature had been injury, a stricture in one, a soft sore, which had been cauterized, in another; external injury, etc. I have had five cases in my experience, one case that of an Italian who had been treated for lues at one of our hospitals, but he had no lues as a careful history elicited in his own language proved; another case of bleeding from the urethra very much resembling one shown to-night with urethral discharge for a month, had been treated for urethritis but careful examination of the bleeding point showed it to be carcinoma. These cases illustrated the fact that every case of this kind coming under our notice should be very carefully examined and not immediately labelled as a case of lues.

Dr. W. F. Hamilton: I had a fatal case of pulmonary hæmorrhage due to tuberculosis similar to the one mentioned to-night and the only one I ever saw. A woman, aged forty-five, came in complaining of hæmorrhage intermittently for three or four days, large and copious. It was pulmonary and we located some signs in the left base. Another hæmorrhage occurred with finally collapse, and autopsy showed a cavity with smooth walls, an aneurysm and a vessel traversing its walls.

Dr. R. E. Powell: I was fortunate enough to have two of these cases of cancer of the penis in my service this spring. One had a direct history of trauma, the other chancre. I did a spirochætæ and Wassermann test in both, which were negative, and then took a snipping and found that it was carcinoma in each case. Both these cases bring up the question of treatment; both were fairly early, in one there was only the prepuce involved, the other the glans penis

well away from the urethra, and the question came up whether amputation or a partial operation was justified inasmuch as the glands were not involved. The man is in perfectly good shape six months after the operation In the second case there was involvement of the glands and while the prepuce alone was involved it was a question whether the penis should not have been entirely removed. I removed as many glands, including the crural group, as I could, but whether the infection had gone in deeper or not time will tell.

Dr. Lauterman: Dr. Powell's remarks on treatment recall another case of mine, a patient aged sixty-two, who came to me in 1897 with a ready-made diagnosis of carcinoma of the penis. I took a section which was examined by some of our best-known pathologists and pronounced epithelioma. He saw two of our leading surgeons who concurred in the diagnosis and suggested a radical operation. This the patient declined absolutely. The inguinal glands were enlarged on both sides and the left thigh was one and a half times its normal size with œdema. About this time I attended a clinic at the Hôtel Dieu given by Sir William Hingston and among other things he showed us a case of epithelioma of the face of twenty years' standing which he was treating with potassa fusæ. His emphatic manner and the statements he made about this impressed me so that I thought of this man who had declined to have an operation done and speaking to Sir William about it he advised me by all means to try it. I secured a stick of the potassa fusæ and applied it freely, put on a moist bichlor. dressing and in about twelve days the eschar came away and the wound healed up; in two weeks the œdema went down and the adenitis disappeared. The patient lived nine years, ultimately dying of pulmonary tuberculosis. I still have the specimen which has been examined by many pathologists who all agree that it was an epithelioma.

Demonstration: 1. *Improved urethral catheter*, by Dr. M. Lauterman.

My difficulties with urethral catheters have been so many that I will not enumerate them. In the first place the expense is an item of importance. Those of you who do this work realize that it is rarely possible to use a catheter more than two or three times and many of them only once, and again there is the difficulty of sterilizing these instruments after once being used and in this you will agree that boiling is the best method. After several visits to various manufacturers I decided to get a fuse wire with a bead fused at the end which I could insert into the finest rubber catheters to give it a body and make the catheter so much easier of insertion.

Once in the ureter all you have to do is very gently withdraw the wire which should come out easily and leave the rubber tube in the ureter. In this way you have a fine catheter in the ureter that does not cause any traumatism; it is soft and flexible and one can inject through it or urine will flow out equally easily. It may be objected that it will kink but so far I have had no such difficulty. One form has a closed end and the other an open end. I have found these especially useful in doing pyelographic work. The solution of thorium which I use in this work is a perfectly clear limpid fluid which flows through anything that water will go through. Another preparation for which I am indebted to Dr. Ed. Young of the pharmacological department of the Massachusetts General Hospital, who worked it out, is an argentide emulsion—an excellent preparation which gives a much better picture than collargol or argyrol.

2. *Urinary test for lues,* by Dr. Lauterman.

In 1907 I visited the laboratory at St. Lazare with Dr. Levy-Bing. This was shortly after Hoffman aand Schaudinn had published their first account of the spirochæta pallida. Levy-Bing, following a suggestion made by Hoffman, undertook to find a method of diagnosing syphilis by means of examining the urine, which ended in failure. The reagent he pinned his faith to was iodine. He thought there should be some combination that would influence the iodine in such a way that it would give a definite reaction as to syphilis. I forgot all about this work until recently, when my attention was called to the reports published by Dr. Carl Gray of Portland, Maine, who had been doing work with iodine that had apparently proved satisfactory. This test depends for its application on the fact that the microörganism causing lues produces certain changes in the metabolism of its host and this fact is taken advantage of in the various tests that have been suggested for the establishment of the diagnosis of lues. The reagents necessary are 1 per cent. solution of resublimed iodine in chemically pure chloroform and 1 per cent. solution of phosphoric acid in distilled water. The other essentials are that the urine to be examined should be freshly voided and should have a specific gravity above 1015; urine of a low specific gravity, such as is seen in nervous polyuria where a large quantity of water is used, gives a positive reaction in spite of the fact that there may be no lues present. Absence of sugar is absolutely essential, and the ingestion of beer or wine interferes with it. The presence of blood, albumin, bile, indican or pus, gonococci, colon bacilli, etc., do not interfere with the test. Its simplicity is an important point; it takes only a few

minutes and is comparatively inexpensive. Dr. Carl D. Gray has found it to be more reliable than the Wassermann reaction; it is equally useful at any period of the disease, being present in one of my own cases before I was able to get the spirochæte even with the dark stage illumination. This test is still in the experimental stage and I offer it to you as I know it.

In the specimens of urine presented here the first is from a girl nine years old with acquired extra-genital lues. The child gave a persistently negative Wassermann until she had her first dose of salvarsan. She is suffering from advanced lues, both her tibiæ are in a frightful state and clinically there is no doubt about the reaction. To 6 c.c. of the urine, which is acid with a specific gravity of about 1015, is added 1 c.c. of a 1 per cent. resublimed iodine in chemically pure chloroform and the mixture is shaken vigorously for two or three minutes. It is then allowed to stand for two or three minutes when the chloroform precipitates and you have a red colour if your reaction is positive. If it becomes clear after the addition of 1 c.c. of the phosphoric acid solution the reaction is negative, but if the colour still remains it is positive.

Another specimen of urine is from a man suffering from cerebral lues. The specific gravity of this specimen is 1022 with a small trace of sugar, Here the reaction is negative, but once the sugar is extracted from the urine it becomes positive.

The test seems to me of value on account of its simplicity, and the effects appear to be fairly constant. It offers a field for investigation to the clinical chemist that I think would well repay careful investigation.

Case Reports:

1. Foreign body in tumour of abdominal wall. By Dr. C. K. P. Henry. (Published in this issue.)

2. Ectopic gestation with unusual complication. By Dr. John R. Fraser. (Published in this issue.)

Discussion: Dr. W. S. Morrow: I am not sufficiently acquainted with this branch of medicine to do more than express my appreciation and general interest, but I would like to ask a question as to the three ounces of ether being instilled in this case.

Dr. W. W. Chipman: I would like to say that I have enjoyed the presentation of this rare case very much and would indicate again the extreme rarity of this condition; so far as I know there is no reported case of its kind in literature. As you know if the tubes are sufficiently damaged, they only have to be damaged to a certain extent to make this ectopic pregnancy possible, and as you know with a Neisser, tuberculous, or pyogenic infection, the tube is

so damaged that the ovum cannot get down nor the spermatozoa get up. In this case there was a tubo-ovarian mass and abscess in the right side and also the left tube beyond the ectopic pregnancy showed signs of a Neisser infection of an extreme degree. It was dilated, wall thickened, and its mucosa, certainly to the naked eye, showed signs of destructive change. Of course the inference is plain that this left tube must have remained sufficiently patent to allow the passage up of the spermatozoa. In the matter of etiology, the view that was taken at the discussion four years ago is simply the one that is being held to-day. I am inclined to believe that the congenital type, the cases of anaplasia, are really the more common of the two. I remember in that discussion I said 50 per cent. of the one and the same of the other, but I am now rather inclined to think that the congenital type is the more common. Since that time I have had two cases of women with no pelvic lesion, perfectly healthy, with two pregnancies and only two, the first in the one tube and the next in the other.

Dr. M. Lauterman: I am very glad to express my obligation to Dr. Fraser for having brought this case before us. I had the fortune to have a chat with him to-day and mentioned that Hæncke in his gynæcological diagnosis refers to the possibility of such a condition, and while I have never seen or even heard of one before it is gratifying to know that we are fortunate enough to have possible cases noted when they do occur. Like many of the other members of the society I recall with a great deal of pleasure Dr. Chipman's paper of four years ago on this subject and as far as I can recall it remains on record as a classical monograph in the English-speaking world. The outstanding feature of this case to-night is the importance of treating gonorrhœa in the male before it gets to the female causing these often disastrous conditions.

Dr. F. A. L. Lockhart: Dr. Fraser's case reminds me of one I had fourteen or fifteen years ago. She certainly had an ectopic on one side and an acute pyosalpinx on the other, but it was an unfortunate case. There is only one criticism I would offer and I think it was a little bit radical to remove the uterus. Personally I never like to do this unless the uterus itself is the seat of infection. My reason for this is that you open up a large area of loose areolar tissue which is exceedingly prone to take on septic infection. This is the reason I practically never remove it unless there is disease of the uterus itself. Where I want to secure sufficient drainage I make a posterior colpotomy and drain through the vagina.

Paper: The paper of the evening was delivered by Dr. D. D. MacTaggart on "Notes on Medical Jurisprudence: Wounds."

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